

#### 901143 - ACIDO MALICO GRANULAR 20/25 MESH



#### SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING 1.1 Product identifier: 901143 - ACIDO MALICO GRANULAR 20/25 MESH DL-malic acid CAS: 617-48-1 EC: 210-514-9 Index: Non-applicable RFACH: 01-2119552463-40-XXXX Other means of identification: Non-applicable 1.2 Relevant identified uses of the substance or mixture and uses advised against: Relevant uses: Food additive. For professional users/industrial user only. Uses advised against: All uses not specified in this section or in section 7.3 1.3 Details of the supplier of the safety data sheet: Quimidroga S.A. C/ Tuset, 26 08006 Barcelona - Spain Phone: +34 932363636 - Fax: +34 934154880 msds@quimidroga.com www.quimidroga.com

**1.4 Emergency telephone number:** +34 932363636 (24h)

#### SECTION 2: HAZARDS IDENTIFICATION

#### 2.1 Classification of the substance or mixture:

#### CLP Regulation (EC) No 1272/2008:

Classification of this product has been carried out in accordance with CLP Regulation (EC) No 1272/2008.

Eye Irrit. 2: Eye irritation, Category 2, H319

#### 2.2 Label elements:

#### CLP Regulation (EC) No 1272/2008:

Warning



#### Hazard statements:

Eye Irrit. 2: H319 - Causes serious eye irritation.

#### **Precautionary statements:**

P264: Wash thoroughly after handling.

P280: Wear protective gloves/protective clothing/respiratory protection/eye protection/protective footwear.

P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P337+P313: If eye irritation persists: Get medical advice/attention.

#### 2.3 Other hazards:

Product fails to meet PBT/vPvB criteria

Endocrine-disrupting properties: The product fails to meet the criteria.

#### SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substance:

Chemical description: Carboxylic acids

#### **Components:**





#### SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS (continued)

#### In accordance with Annex II of Regulation (EC) No 1907/2006 (point 3), the product contains:

	Identification		Chemical name/Classification C		
EC: Index:		DL-malic acid Self-classified			
	210-514-9 Non-applicable 01-2119552463-40- XXXX	Regulation 1272/2008	Eye Irrit. 2: H319 - Warning	100 %	

To obtain more information on the hazards of the substances consult sections 11, 12 and 16.

#### 3.2 Mixture:

Non-applicable

#### SECTION 4: FIRST AID MEASURES

#### 4.1 Description of first aid measures:

The symptoms resulting from intoxication can appear after exposure, therefore, in case of doubt, seek medical attention for direct exposure to the chemical product or persistent discomfort, showing the SDS of this product.

#### By inhalation:

This product does not contain substances classified as hazardous for inhalation, however, in case of symptoms of intoxication remove the person affected from the exposure area and provide with fresh air. Seek medical attention if the symptoms get worse or persist.

#### By skin contact:

In case of contact it is recommended to clean the affected area thoroughly with water and neutral soap. In case of changes to the skin (stinging, redness, rashes, blisters,...), seek medical advice with this Safety Data Sheet

#### By eye contact:

Rinse eyes thoroughly with lukewarm water for at least 15 minutes. Do not allow the person affected to rub or close their eyes. If the injured person uses contact lenses, these should be removed unless they are stuck to the eyes, in which case this could cause further damage. In all cases, after cleaning, a doctor should be consulted as quickly as possible with the SDS of the product.

#### By ingestion/aspiration:

In case of consumption, seek immediate medical assistance showing the SDS for the product.

#### 4.2 Most important symptoms and effects, both acute and delayed:

Acute and delayed effects are indicated in sections 2 and 11.

#### 4.3 Indication of any immediate medical attention and special treatment needed:

Non-applicable

#### SECTION 5: FIREFIGHTING MEASURES

#### 5.1 Extinguishing media:

#### Suitable extinguishing media:

Product is non-flammable under normal conditions of storage, handling and use. In the case of combustion as a result of improper handling, storage or use preferably use polyvalent powder extinguishers (ABC powder), in accordance with the Regulation on fire protection systems.

#### Unsuitable extinguishing media:

Non-applicable

#### 5.2 Special hazards arising from the substance or mixture:

As a result of combustion or thermal decomposition reactive sub-products are created that can become highly toxic and, consequently, can present a serious health risk.

#### 5.3 Advice for firefighters:

Depending on the magnitude of the fire it may be necessary to use full protective clothing and self-contained breathing apparatus (SCBA). Minimum emergency facilities and equipment should be available (fire blankets, portable first aid kit,...) in accordance with Directive 89/654/EC.

#### Additional provisions:

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#### SECTION 5: FIREFIGHTING MEASURES (continued)

Act in accordance with the Internal Emergency Plan and the Information Sheets on actions to take after an accident or other emergencies. Eliminate all sources of ignition. In case of fire, cool the storage containers and tanks for products susceptible to combustion, explosion or BLEVE as a result of high temperatures. Avoid spillage of the products used to extinguish the fire into an aqueous medium.

#### SECTION 6: ACCIDENTAL RELEASE MEASURES

#### 6.1 Personal precautions, protective equipment and emergency procedures:

#### For non-emergency personnel:

Sweep up and shovel product or collect by other means and place in container for reuse (preferred) or disposal

#### For emergency responders:

Wear protective equipment. Keep unprotected persons away. See section 8.

#### 6.2 Environmental precautions:

This product is not classified as hazardous to the environment. Keep product away from drains, surface and ground water.

#### 6.3 Methods and material for containment and cleaning up:

#### It is recommended:

Sweep up and shovel product or collect by other means and place in container for reuse (preferred) or disposal

#### 6.4 Reference to other sections:

See sections 8 and 13.

#### SECTION 7: HANDLING AND STORAGE

#### 7.1 Precautions for safe handling:

A.- General precautions for safe use

Comply with the current legislation concerning the prevention of industrial risks with regards manually handling weights. Maintain order, cleanliness and destroy using safe methods (section 6).

- B.- Technical recommendations for the prevention of fires and explosions
  - Due to its inflammable nature, the product does not present a fire risk under normal conditions of storage, handling and use.
- C.- Technical recommendations on general occupational hygiene

Do not eat or drink during the process, washing hands afterwards with suitable cleaning products.

D.- Technical recommendations to prevent environmental risks

It is recommended to have absorbent material available at close proximity to the product (See subsection 6.3)

#### 7.2 Conditions for safe storage, including any incompatibilities:

#### A.- Technical measures for storage

Minimum Temp.:5 °CMaximum Temp.:30 °CMaximum time:6 Months

B.- General conditions for storage

Avoid sources of heat, radiation, static electricity and contact with food. For additional information see subsection 10.5

#### 7.3 Specific end use(s):

Except for the instructions already specified it is not necessary to provide any special recommendation regarding the uses of this product.

#### SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

#### 8.1 Control parameters:





#### SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION (continued)

Substances whose occupational exposure limits have to be monitored in the workplace (European OEL, not country-specific legislation):

Nuisance dust: Inhalable dust 10 mg/m3 // Respirable dust 4 mg/m3

#### DNEL (Workers):

		Short e	xposure	Long exposure	
Identification		Systemic	Local	Systemic	Local
DL-malic acid	Oral	Non-applicable	Non-applicable	Non-applicable	Non-applicable
CAS: 617-48-1	Dermal	40 mg/kg	Non-applicable	2 mg/kg	Non-applicable
EC: 210-514-9	Inhalation	104 mg/m <sup>3</sup>	104 mg/m <sup>3</sup>	5,33 mg/m <sup>3</sup>	32 mg/m <sup>3</sup>

#### DNEL (General population):

	Short e	xposure	Long exposure		
Identification		Systemic	Local	Systemic	Local
DL-malic acid	Oral	20 mg/kg	Non-applicable	6 mg/kg	Non-applicable
CAS: 617-48-1	Dermal	20 mg/kg	Non-applicable	6 mg/kg	Non-applicable
EC: 210-514-9	Inhalation	52 mg/m <sup>3</sup>	52 mg/m <sup>3</sup>	1,6 mg/m <sup>3</sup>	1,6 mg/m <sup>3</sup>

#### PNEC:

Identification				
DL-malic acid	STP	3 mg/L	Fresh water	0,1 mg/L
CAS: 617-48-1	Soil	Non-applicable	Marine water	0,01 mg/L
EC: 210-514-9	Intermittent	1 mg/L	Sediment (Fresh water)	Non-applicable
	Oral	Non-applicable	Sediment (Marine water)	Non-applicable

#### 8.2 Exposure controls:

A.- Individual protection measures, such as personal protective equipment

As a preventative measure it is recommended to use basic Personal Protective Equipment, with the corresponding <<CE marking>> in accordance with Regulation (EU) 2016/425. For more information on Personal Protective Equipment (storage, use, cleaning, maintenance, class of protection,...) consult the information leaflet provided by the manufacturer. For more information see subsection 7.1. All information contained herein is a recommendation which needs some specification from the labour risk prevention services as it is not known whether the company has additional measures at its disposal.

#### B.- Respiratory protection

	Pictogram	PPE	Labelling	CEN Standard	Remarks				
	Compulsory use of face mask	Filter mask for particles		EN 149:2001+A1:2009	Replace when an increase in resistence to breathing is observed.				
С	C Specific protection for the hands								
	Pictogram	PPE	Labelling	CEN Standard	Remarks				
	Mandatory hand protection	Protective gloves against minor risks	CATI		Replace gloves in case of any sign of damage. For prolonged periods of exposure to the product for professional users/industrials, we recommend using CE III gloves in line with standards EN 420:2004+ A1:2010 and EN ISO 374-1:2016+A1:2018				
D	Eye and face prot	ection							
	Pictogram	PPE	Labelling	CEN Standard	Remarks				
	Mandatory face protection	Panoramic glasses against splash/projections.	CAT II	EN 166:2002 EN ISO 4007:2018	Clean daily and disinfect periodically according to the manufacturer's instructions. Use if there is a risk of splashing.				
E	Body protection								





Pictogram		PPE	Labelling		CEN Standard		Remarks
	w	/ork clothing	CATI			perioo recom	ce before any evidence of deterioration. ds of prolonged exposure to the product professional/industrial users CE III is mended, in accordance with the regulati ISO 6529:2013, EN ISO 6530:2005, EN I 13688:2013, EN 464:1994.
	Anti-	slip work shoes		EN	ISO 20347:2012	perioo	ce before any evidence of deterioration. Is of prolonged exposure to the product professional/industrial users CE III is mended, in accordance with the regulati EN ISO 20345:2012 y EN 13832-1:2007
Additional emer	gency me	asures				•	
Emergency n	neasure	SI	tandards		Emergency measu	ire	Standards
Emergency			ANSI Z358-1 2011, ISO 3864-4:2011		Eyewash stations		DIN 12 899 ISO 3864-1:2011, ISO 3864-4:2011
Environmental e	xposure c	ontrols:					
LINNOITHEILLAIE							
	e product a	nd its container.					
In accordance with spillage of both the	e product a compound	nd its container. ds:	For additional in	format	ion see subsectior		nmended to avoid environmental
in accordance with spillage of both the <b>folded set of both the</b>	e product a compound ective 2010	nd its container. ds: //75/EU, this prod	For additional in	format	ion see subsectior		
in accordance with spillage of both the <b>/olatile organic</b> ( With regard to Dire	e product a compound ective 2010 ::	nd its container. ds: //75/EU, this pro 0 %	For additional in duct has the follo	format	ion see subsectior		
n accordance with pillage of both the <b>/olatile organic</b> Vith regard to Dire V.O.C. (Supply)	e product a compound ective 2010 :: at 20 °C:	nd its container. ds: i/75/EU, this pro 0 % 0 kg/	For additional in duct has the follo weight	format	ion see subsectior		

#### SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

#### 9.1 Information on basic physical and chemical properties:

For	complete	information	see	the	product	datasheet.

Appearance:	
Physical state at 20 °C:	Solid
Appearance:	Granulated
Colour:	White
Odour:	Odourless
Odour threshold:	Non-applicable *
Volatility:	
Boiling point at atmospheric pressure:	Non-applicable *
Vapour pressure at 20 °C:	Non-applicable *
Vapour pressure at 50 °C:	Non-applicable *
Evaporation rate at 20 °C:	Non-applicable *
Product description:	
Density at 20 °C:	Non-applicable *
Relative density at 20 °C:	Non-applicable *
Dynamic viscosity at 20 °C:	Non-applicable *
Kinematic viscosity at 20 °C:	Non-applicable *
Kinematic viscosity at 40 °C:	Non-applicable *
*Not relevant due to the nature of the product, not providing	information property of its hazards.





SEC	TION 9: PHYSICAL AND CHEMICAL PROPERTIE	S (continued)
	Concentration:	Non-applicable *
	pH:	Non-applicable *
	Vapour density at 20 °C:	Non-applicable *
	Partition coefficient n-octanol/water 20 °C:	-1,26
	Solubility in water at 20 °C:	558 kg/m³
	Solubility properties:	Non-applicable *
	Decomposition temperature:	Non-applicable *
	Melting point/freezing point:	127 - 132 °C
	Flammability:	
	Flash Point:	203 °C
	Flammability (solid, gas):	Non-applicable *
	Autoignition temperature:	349 °C
	Lower flammability limit:	Non-applicable *
	Upper flammability limit:	Non-applicable *
	Explosive (Solid):	
	Lower explosive limit:	Non-applicable *
	Upper explosive limit:	Non-applicable *
	Particle characteristics:	
	Median equivalent diameter:	Non-applicable *
9.2	Other information:	
	Information with regard to physical hazard clas	ises:
	Explosive properties:	Non-applicable *
	Oxidising properties:	Non-applicable *
	Corrosive to metals:	Non-applicable *
	Heat of combustion:	Non-applicable *
	Aerosols-total percentage (by mass) of flammable components:	Non-applicable *
	Other safety characteristics:	
	Surface tension at 20 °C:	Non-applicable *
	Refraction index:	Non-applicable *
	*Not relevant due to the nature of the product, not providing info	rmation property of its hazards.

## SECTION 10: STABILITY AND REACTIVITY

#### 10.1 Reactivity:

No hazardous reactions are expected because the product is stable under recommended storage conditions. See section 7.

#### 10.2 Chemical stability:

Chemically stable under the indicated conditions of storage, handling and use.

#### 10.3 Possibility of hazardous reactions:

Under the specified conditions, hazardous reactions that lead to excessive temperatures or pressure are not expected.

#### 10.4 Conditions to avoid:

Applicable for handling and storage at room temperature:

Shock and friction	Contact with air	Increase in temperature	Sunlight	Humidity
Not applicable	Not applicable	Not applicable	Not applicable	Not applicable

#### **10.5** Incompatible materials:





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#### SECTION 10: STABILITY AND REACTIVITY (continued)

Acids	Water	Oxidising materials	Combustible materials	Others
Avoid strong acids	Not applicable	Not applicable	Not applicable	Avoid alkalis or strong bases

#### **10.6** Hazardous decomposition products:

See subsection 10.3, 10.4 and 10.5 to find out the specific decomposition products. Depending on the decomposition conditions, complex mixtures of chemical substances can be released: carbon dioxide ( $CO_2$ ), carbon monoxide and other organic compounds.

#### SECTION 11: TOXICOLOGICAL INFORMATION

#### 11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008:

#### Dangerous health implications:

In case of exposure that is repetitive, prolonged or at concentrations higher than the recommended occupational exposure limits, adverse effects on health may result, depending on the means of exposure:

- A- Ingestion (acute effect):
  - Acute toxicity : Based on available data, the classification criteria are not met, as it does not contain substances classified as hazardous for consumption. For more information see section 3
  - Corrosivity/Irritability: Based on available data, the classification criteria are not met, as it does not contain substances classified as hazardous for this effect. For more information see section 3.
- B- Inhalation (acute effect):

- Acute toxicity : Based on available data, the classification criteria are not met, as it does not contain substances classified as hazardous for inhalation. For more information see section 3.

- Corrosivity/Irritability: Based on available data, the classification criteria are not met, as it does not contain substances classified as hazardous for this effect. For more information see section 3.
- C- Contact with the skin and the eyes (acute effect):
  - Contact with the skin: Based on available data, the classification criteria are not met, as it does not contain substances classified as hazardous for skin contact. For more information see section 3.
  - Contact with the eyes: Produces eye damage after contact.
- D- CMR effects (carcinogenicity, mutagenicity and toxicity to reproduction):
  - Carcinogenicity: Based on available data, the classification criteria are not met, as it does not contain substances classified as hazardous for the effects mentioned. For more information see section 3.
  - IARC: Non-applicable

- Mutagenicity: Based on available data, the classification criteria are not met, as it does not contain substances classified as hazardous for this effect. For more information see section 3.

- Reproductive toxicity: Based on available data, the classification criteria are not met, as it does not contain substances classified as hazardous for this effect. For more information see section 3.
- E- Sensitizing effects:
  - Respiratory: Based on available data, the classification criteria are not met, as it does not contain substances classified as hazardous with sensitising effects. For more information see section 3.
  - Skin: Based on available data, the classification criteria are not met, as it does not contain substances classified as hazardous for this effect. For more information see section 3.
- F- Specific target organ toxicity (STOT) single exposure:

Based on available data, the classification criteria are not met, as it does not contain substances classified as hazardous for this effect. For more information see section 3.

- G- Specific target organ toxicity (STOT)-repeated exposure:
  - Specific target organ toxicity (STOT)-repeated exposure: Based on available data, the classification criteria are not met, as it does not contain substances classified as hazardous for this effect. For more information see section 3.
  - Skin: Based on available data, the classification criteria are not met, as it does not contain substances classified as
  - hazardous for this effect. For more information see section 3.
- H- Aspiration hazard:

Based on available data, the classification criteria are not met, as it does not contain substances classified as hazardous for this effect. For more information see section 3.

#### Other information:

Non-applicable

#### Product-specific toxicological information:





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SECT	ION 11: TOXICOLOGICAL IN	IFORMATION (continued)					
		Acute toxicity			Genus		
	LD50 oral	10700 mg/kg		Rat			
	Specific toxicology information on the substances:						
	Identification			Acute toxicity			
	DL-malic acid		LD50 oral		10700 mg/kg	Rat	
	CAS: 617-48-1		LD50 dern	nal	>2000 mg/kg		
	EC: 210-514-9		LC50 inhal	lation	>5 mg/L		
11.2	Information on other hazard	s:					

#### Endocrine disrupting properties

Endocrine-disrupting properties: The product fails to meet the criteria.

#### Other information

Non-applicable

#### SECTION 12: ECOLOGICAL INFORMATION

#### 12.1 Toxicity:

Not available

- 12.2 Persistence and degradability: Not available
  12.3 Bioaccumulative potential:
  - Not available
- **12.4 Mobility in soil:** 
  - Not available
- 12.5 Results of PBT and vPvB assessment: Product fails to meet PBT/vPvB criteria
- **12.6 Endocrine disrupting properties:** Endocrine-disrupting properties: The r

Endocrine-disrupting properties: The product fails to meet the criteria.

12.7 Other adverse effects:

Not described

#### SECTION 13: DISPOSAL CONSIDERATIONS

#### 13.1 Waste treatment methods:

Code	Description	Waste class (Regulation (EU) No 1357/2014)
20 01 14*	Acids	Dangerous

#### Type of waste (Regulation (EU) No 1357/2014):

HP4 Irritant — skin irritation and eye damage

#### Waste management (disposal and evaluation):

Consult the authorized waste service manager on the assessment and disposal operations in accordance with Annex 1 and Annex 2 (Directive 2008/98/EC). As under 15 01 (2014/955/EC) of the code and in case the container has been in direct contact with the product, it will be processed the same way as the actual product. Otherwise, it will be processed as non-dangerous residue. Waste should not be disposed of to drains. See paragraph 6.2.

#### **Regulations related to waste management:**

In accordance with Annex II of Regulation (EC) No 1907/2006 (REACH) the community or state provisions related to waste management are stated

Community legislation: Directive 2008/98/EC, 2014/955/EU, Regulation (EU) No 1357/2014



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#### SECTION 14: TRANSPORT INFORMATION

This product is not regulated for transport (ADR/RID,IMDG,IATA)

#### SECTION 15: REGULATORY INFORMATION

#### 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture:

Candidate substances for authorisation under the Regulation (EC) No 1907/2006 (REACH): Non-applicable

Substances included in Annex XIV of REACH ("Authorisation List") and sunset date: Non-applicable

Regulation (EC) No 1005/2009, about substances that deplete the ozone layer: Non-applicable

Article 95, REGULATION (EU) No 528/2012: Non-applicable

REGULATION (EU) No 649/2012, in relation to the import and export of hazardous chemical products: Non-applicable

#### Seveso III:

Non-applicable

Limitations to commercialisation and the use of certain dangerous substances and mixtures (Annex XVII REACH, etc ....):

Non-applicable

#### Specific provisions in terms of protecting people or the environment:

It is recommended to use the information included in this safety data sheet as a basis for conducting workplace-specific risk assessments in order to establish the necessary risk prevention measures for the handling, use, storage and disposal of this product.

#### Other legislation:

The product could be affected by sectorial legislation

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

#### 15.2 Chemical safety assessment:

The supplier has not carried out evaluation of chemical safety.

#### SECTION 16: OTHER INFORMATION

#### Legislation related to safety data sheets:

The SDS shall be supplied in an official language of the country where the product is placed on the market. This safety data sheet has been designed in accordance with ANNEX II-Guide to the compilation of safety data sheets of Regulation (EC) No 1907/2006 (COMMISSION REGULATION (EU) 2020/878).

#### Modifications related to the previous Safety Data Sheet which concerns the ways of managing risks.:

COMMISSION REGULATION (EU) 2020/878

#### Texts of the legislative phrases mentioned in section 2:

H319: Causes serious eye irritation.

#### Texts of the legislative phrases mentioned in section 3:

The phrases indicated do not refer to the product itself; they are present merely for informative purposes and refer to the individual components which appear in section 3

#### CLP Regulation (EC) No 1272/2008:

Eye Irrit. 2: H319 - Causes serious eye irritation.

#### Advice related to training:

Training is recommended in order to prevent industrial risks for staff using this product and to facilitate their comprehension and interpretation of this safety data sheet, as well as the label on the product.

#### Principal bibliographical sources:

http://echa.europa.eu http://eur-lex.europa.eu Abbreviations and acronyms:







### SECTION 16: OTHER INFORMATION (continued)

ADR: European agreement concerning the international carriage of dangerous goods by road IMDG: International maritime dangerous goods code IATA: International Air Transport Association ICAO: International Civil Aviation Organisation COD: Chemical Oxygen Demand BOD5: 5day biochemical oxygen demand BCF: Bioconcentration factor LD50: Lethal Dose 50 LC50: Lethal Concentration 50 EC50: Effective concentration 50 LogPOW: Octanolwater partition coefficient Koc: Partition coefficient of organic carbon UFI: unique formula identifier IARC: International Agency for Research on Cancer

The information contained in this safety data sheet is based on sources, technical knowledge and current legislation at European and state level, without being able to guarantee its accuracy. This information cannot be considered a guarantee of the properties of the product, it is simply a description of the security requirements. The occupational methodology and conditions for users of this product are not within our awareness or control, and it is ultimately the responsibility of the user to take the necessary measures to obtain the legal requirements concerning the manipulation, storage, use and disposal of chemical products. The information on this safety data sheet only refers to this product, which should not be used for needs other than those specified.

- END OF SAFETY DATA SHEET -

Date of compilation: 04/09/2019

Revised: 06/10/2022 Version: 2 (Replaced 1)

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Section 1: Title of exposure scen	ario
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	s of use
Contributing scenario controlling ERC2 Formulation of mixture in close	• • • • • • • • • • • • • • • • • • • •
Amounts used, Frequency and de	uration 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 <sup>3</sup> m³/days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related	to external treatment of waste for disposal

	ste treatment operations: No (low risk) (ERC based assessment demonstrating control risk assumed for waste life stage. Waste disposal according to national/local legislation
Other given operational condition	ns affecting environmental exposure
Receiving surface water flow	≥ 1.8 X 10 <sup>4</sup> m <sup>3</sup> /days
Contributing scenario controlling PROC1 Use in closed process, no l	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and d	uration of use
Duration of activity	<8 hour(s)
Technical conditions and measured	res 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 condition	ns 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 <sup>2</sup> )
Contributing scenario controlling PROC2 Use in closed, continuous p	worker exposure (2) process with occasional controlled exposure
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and d	uration of use
Duration of activity	<8 hour(s)
Technical conditions and measu	res to control dispersion from source towards the worker
General ventilation	Basic general ventilation (1-3 air changes per hour) 12

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 condition	s 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 <sup>2</sup> )	
Contributing scenario controlling PROC4 Use in batch and other proc	worker exposure (3) cess (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 du	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measur	es 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 condition	as 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 <sup>2</sup> )	_
Contributing scenario controlling PROC8b Receiving and charging of		
Product (article) characteristic		13

	-	
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and d	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measu	res 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 condition	ns affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Elevated temperature < melting point	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Contributing scenario controlling PROC3 Mixing, dispersing, comple		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and d	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measu	res 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	14,

Other given operational condition	ns 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 <sup>2</sup> )
Contributing scenario controlling PROC5 Mixing, dispersing and corr	worker exposure (6) Ipletion in open multistage batch process
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and de	uration of use
Duration of activity	<8 hour(s)
Technical conditions and measur	es 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 condition	s 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 <sup>2</sup> )
Contributing scenario controlling PROC8a Transfer in non-dedicated	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and de	uration of use
Duration of activity	<8 hour(s)
Technical conditions and measure	es 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 condition	s affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Elevated temperature < melting point	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Contributing scenario controlling PROC8b Transfer at dedicated facil	• • • • • •	
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and du	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measur	es 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 condition	as affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Elevated temperature < melting point	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Contributing scenario controlling PROC9 Filling small containers in d		
Product (article) characteristic		16

	-	
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and d	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measu	res 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 condition	ns 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 <sup>2</sup> )	
Contributing scenario controlling PROC8a Maintenance and cleaning		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and d	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measu	res 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	17.

Other given operational condition	is affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Elevated temperature < melting point	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Contributing scenario controlling PROC15 Use as laboratory reagent	• • • •	
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and du	iration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measur	es to control dispersion from source tov	vards the worker
General ventilation	Basic general ventilation (1-3 air change	s 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 hea	Ith evaluation
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effec	tiveness - Dermal: 80%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]	
Eye Protection	Safety spectacles/goggles/full face shield	d
Other given operational condition	s 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 <sup>2</sup> )	
Section 3: Exposure estimation a	nd reference to its source	
Contributing scenario controlling ERC2 Formulation of mixture in close		
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
/lan via Environment - Oral	0.278 mg/kg bw/day	0.046
contributing scenario controlling wo ROC1 Use in closed process, no likel		
Method: TRA Worker v3		
coute of exposure and type of ffects	Exposure concentration	Risk characterisation ratio
nhalation, Systemic effects, _ong Term	0.01 mg/m³	<0.01
nhalation, Systemic effects, Acute	0.04 mg/m <sup>3</sup>	<0.01
nhalation, Local effects, _ong Term	0.01 mg/m³	<0.01
Inhalation, Local effects, Acute	0.04 mg/m <sup>3</sup>	<0.01
Dermal, Systemic effects, ₋ong Term	0.007 mg/kg bw/day	<0.01
Dermal, Local effects, Long Term	0.002 mg/cm <sup>2</sup>	<0.01
Combined routes, Systemic offects, Long Term	-	<0.01
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling we		
-ROCZ Use in closed, continuous proc	ess with occasional controlled exposure	
	ess with occasional controlled exposure	
Method: TRA Worker v3 Route of exposure and type of effects	ess with occasional controlled exposure Exposure concentration	Risk characterisation ratio
Method: TRA Worker v3 Route of exposure and type of effects nhalation, Systemic effects,		
Method: TRA Worker v3         Route of exposure and type of offects         Inhalation, Systemic effects, ong Term	Exposure concentration	Risk characterisation ratio
Method: TRA Worker v3 Route of exposure and type of effects nhalation, Systemic effects, ong Term nhalation, Systemic effects, Acute nhalation, Local effects,	Exposure concentration 0.01 mg/m <sup>3</sup>	Risk characterisation ratio
Method: TRA Worker v3         Route of exposure and type of ffects         Inhalation, Systemic effects, ong Term         Inhalation, Systemic effects, Acute         Inhalation, Local effects, ong Term	Exposure concentration 0.01 mg/m <sup>3</sup> 0.04 mg/m <sup>3</sup>	Risk characterisation ratio
Method: TRA Worker v3 Route of exposure and type of effects nhalation, Systemic effects, ong Term nhalation, Systemic effects, Acute nhalation, Local effects, Acute Dermal, Systemic effects,	Exposure concentration 0.01 mg/m <sup>3</sup> 0.04 mg/m <sup>3</sup> 0.01 mg/m <sup>3</sup>	Risk characterisation ratio           <0.01
Method: TRA Worker v3 Route of exposure and type of effects nhalation, Systemic effects, Long Term nhalation, Local effects, Acute nhalation, Local effects, Acute Dermal, Systemic effects, Long Term	Exposure concentration 0.01 mg/m <sup>3</sup> 0.04 mg/m <sup>3</sup> 0.01 mg/m <sup>3</sup> 0.04 mg/m <sup>3</sup>	Risk characterisation ratio           <0.01
Method: TRA Worker v3 Route of exposure and type of	Exposure concentration 0.01 mg/m <sup>3</sup> 0.04 mg/m <sup>3</sup> 0.01 mg/m <sup>3</sup> 0.04 mg/m <sup>3</sup> 0.274 mg/kg bw/day	Risk characterisation ratio           <0.01

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 <sup>2</sup>	0.2
Combined routes, Systemic effects, Long Term	-	0.78
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling v PROC8b Receiving and charging of t	,	
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/m <sup>3</sup>	<0.01
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.704
, 5		

Method: TRA Worker v3		
Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Inhalation, Systemic effects, Long Term	0.1 mg/m <sup>3</sup>	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 <sup>2</sup>	0.02
Combined routes, Systemic effects, Long Term	-	0.053
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling v PROC5 Mixing, dispersing and comp	worker exposure (6) letion in open multistage batch process	
Method: TRA Worker v3		
Method: TRA Worker v3 Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Route of exposure and type of	Exposure concentration 0.5 mg/m <sup>3</sup>	Risk characterisation ratio
Route of exposure and type of effects Inhalation, Systemic effects, Long Term		
Route of exposure and type of effects Inhalation, Systemic effects,	0.5 mg/m³	0.094
Route of exposure and type of effects Inhalation, Systemic effects, Long Term Inhalation, Systemic effects, Acute Inhalation, Local effects, Long Term	0.5 mg/m <sup>3</sup>	0.094
Route of exposure and type of effects Inhalation, Systemic effects, Long Term Inhalation, Systemic effects, Acute Inhalation, Local effects,	0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup> 0.5 mg/m <sup>3</sup>	0.094 0.019 0.016
Route of exposure and type of effects Inhalation, Systemic effects, Long Term Inhalation, Systemic effects, Acute Inhalation, Local effects, Long Term Inhalation, Local effects, Acute Dermal, Systemic effects, Long Term	0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup> 0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup>	0.094 0.019 0.016 0.019
Route of exposure and type of effects Inhalation, Systemic effects, Long Term Inhalation, Systemic effects, Acute Inhalation, Local effects, Long Term Inhalation, Local effects, Acute Dermal, Systemic effects, Long Term Dermal, Local effects, Long Term Combined routes, Systemic	0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup> 0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup> 1.371 mg/kg bw/day	0.094 0.019 0.016 0.019 0.686
Route of exposure and type of effects Inhalation, Systemic effects, Long Term Inhalation, Systemic effects, Acute Inhalation, Local effects, Long Term Inhalation, Local effects, Acute Dermal, Systemic effects, Long Term Dermal, Local effects, Long Term Combined routes, Systemic effects, Long Term Combined routes, Systemic	0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup> 0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup> 1.371 mg/kg bw/day	0.094 0.019 0.016 0.019 0.686 0.2
Route of exposure and type of effects Inhalation, Systemic effects, Long Term Inhalation, Systemic effects, Acute Inhalation, Local effects, Long Term Inhalation, Local effects, Acute Dermal, Systemic effects,	0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup> 0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup> 1.371 mg/kg bw/day 0.2 mg/cm <sup>2</sup> - - worker exposure (7)	0.094 0.019 0.016 0.019 0.686 0.2 0.779

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 <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
<b>Contributing scenario controlling w</b> PROC8b Transfer at dedicated faciliti		
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/m <sup>3</sup>	<0.01
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.704
Combined routes, Systemic effects, Acute	-	<0.01

Method: TRA Worker v3		
Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Inhalation, Systemic effects, Long Term	0.1 mg/m <sup>3</sup>	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m <sup>3</sup>	<0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	<0.01
Inhalation, Local effects, Acute	0.4 mg/m <sup>3</sup>	<0.01
Dermal, Systemic effects, Long Term	0.686 mg/kg bw/day	0.343
Dermal, Local effects, Long Term	0.1 mg/cm <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.362
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling w PROC8a Maintenance and cleaning o		
Method: TRA Worker v3		
Route of exposure and type of	Exposure concentration	<b>Risk characterisation ratio</b>
effects		
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects,	0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup>	0.094
Inhalation, Systemic effects, Long Term	Ĵ	
Inhalation, Systemic effects, Long Term Inhalation, Systemic effects, Acute Inhalation, Local effects,	2 mg/m³	0.019
Inhalation, Systemic effects, Long Term Inhalation, Systemic effects, Acute Inhalation, Local effects, Long Term	2 mg/m³ 0.5 mg/m³	0.019
Inhalation, Systemic effects, Long Term Inhalation, Systemic effects, Acute Inhalation, Local effects, Long Term Inhalation, Local effects, Acute Dermal, Systemic effects,	2 mg/m <sup>3</sup> 0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup>	0.019 0.016 0.019
Inhalation, Systemic effects, Long Term Inhalation, Systemic effects, Acute Inhalation, Local effects, Long Term Inhalation, Local effects, Acute Dermal, Systemic effects, Long Term	2 mg/m <sup>3</sup> 0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup> 1.371 mg/kg bw/day	0.019 0.016 0.019 0.686

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/m <sup>3</sup>	<0.01	
Inhalation, Local effects, Long Term	0.1 mg/m³	<0.01	
Inhalation, Local effects, Acute	0.4 mg/m <sup>3</sup>	<0.01	
Dermal, Systemic effects, Long Term	0.068 mg/kg bw/day	0.034	
Dermal, Local effects, Long Term	0.02 mg/cm <sup>2</sup>	0.02	
Combined routes, Systemic effects, Long Term	-	0.053	
Combined routes, Systemic effects, Acute	-	<0.01	
Section 4: Guidance to DU to evaluate	te whether he works inside the bound	daries set by the ES	
No additional risk management measur workers.	res, besides those that are mentioned a	bove, are needed to guarantee safe use for	

### 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 24	

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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	$\geq$ 2 X 10 <sup>3</sup> m <sup>3</sup> /days	
Application of the STP sludge on agricultural soil	Yes	
Conditions and measures related	to external treatment of waste for disposal	
	te treatment operations: No (low risk) (ERC based assessment demonstrating control sk assumed for waste life stage. Waste disposal according to national/local legislation	
Other given operational conditions	s affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10 <sup>4</sup> m³/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 du	ration 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 <sup>2</sup> )	

Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and du	ration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measure	es 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 condition	s affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands face (480 cm <sup>2</sup> )	
Contributing scenario controlling PROC10 Roller application or brushi	worker exposure (3) ng - 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 du	ration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measure	es 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%]	26

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 condition	s affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Contributing scenario controlling PROC7 Industrial spraying	worker exposure (4)	
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and du	ration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measure	es 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 condition	s affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands and upper wrists (1500 cm <sup>2</sup> )	
Contributing scenario controlling PROC13 Treatment of articles by dip		
Product (article) characteristic		
Dustiness of material	Low	27

Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and du	Iration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measure	es 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 condition	s affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands face (480 cm <sup>2</sup> )	
Contributing scenario controlling PROC15 Use as laboratory reagent	worker exposure (6)	
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and du	iration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measure	es 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	28

Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	One hand face only (240 cm <sup>2</sup> )	
Section 3: Exposure estimation	and reference to its source	
Contributing scenario controllin ERC5 Uses for industrial manual e		
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/m³	<0.01
Man via Environment - Oral <b>Contributing scenario controllin</b>	1.941 mg/kg bw/day g worker exposure (1)	0.324
Man via Environment - Oral Contributing scenario controllin PROC8b Transfer of substance or facilities	1.941 mg/kg bw/day	0.324
Man via Environment - Inhalation Man via Environment - Oral <b>Contributing scenario controllin</b> PROC8b Transfer of substance or facilities Method: TRA Worker v3 <b>Route of exposure and type of</b> effects	1.941 mg/kg bw/day g worker exposure (1)	0.324 vessels/large containers at dedicated
Man via Environment - Oral <b>Contributing scenario controllin</b> PROC8b Transfer of substance or facilities Method: TRA Worker v3 <b>Route of exposure and type of</b> <b>effects</b> Inhalation, Systemic effects,	1.941 mg/kg bw/day g worker exposure (1) preparation (charging/discharging) from/to v	0.324 vessels/large containers at dedicated
Man via Environment - Oral Contributing scenario controllin PROC8b Transfer of substance or facilities Method: TRA Worker v3 Route of exposure and type of effects Inhalation, Systemic effects, Long Term	1.941 mg/kg bw/day         g worker exposure (1)         preparation (charging/discharging) from/to v         Exposure concentration         0.07 mg/m³	0.324 vessels/large containers at dedicated Risk characterisation ratio
Man via Environment - Oral Contributing scenario controllin PROC8b Transfer of substance or facilities Method: TRA Worker v3 Route of exposure and type of effects Inhalation, Systemic effects, Long Term Inhalation, Systemic effects, Acute Inhalation, Local effects,	1.941 mg/kg bw/day         g worker exposure (1)         preparation (charging/discharging) from/to v         Exposure concentration         0.07 mg/m³	0.324 vessels/large containers at dedicated Risk characterisation ratio 0.013
Man via Environment - Oral Contributing scenario controllin PROC8b Transfer of substance or facilities Method: TRA Worker v3 Route of exposure and type of effects Inhalation, Systemic effects, Long Term Inhalation, Local effects, Long Term	1.941 mg/kg bw/day         g worker exposure (1)         preparation (charging/discharging) from/to v         Exposure concentration         0.07 mg/m³         0.28 mg/m³	0.324 vessels/large containers at dedicated Risk characterisation ratio 0.013 <0.01
Man via Environment - Oral Contributing scenario controllin PROC8b Transfer of substance or facilities Method: TRA Worker v3 Route of exposure and type of	1.941 mg/kg bw/day         g worker exposure (1)         preparation (charging/discharging) from/to v         Exposure concentration         0.07 mg/m³         0.28 mg/m³         0.07 mg/m³	0.324 vessels/large containers at dedicated Risk characterisation ratio 0.013 <0.01 <0.01 <0.01
Man via Environment - Oral Contributing scenario controllin PROC8b Transfer of substance or facilities Method: TRA Worker v3 Route of exposure and type of effects nhalation, Systemic effects, _ong Term nhalation, Local effects, Acute nhalation, Local effects, Acute Dermal, Systemic effects,	1.941 mg/kg bw/day         g worker exposure (1)         preparation (charging/discharging) from/to v         Exposure concentration         0.07 mg/m³         0.28 mg/m³         0.07 mg/m³         0.28 mg/m³         0.28 mg/m³	0.324 vessels/large containers at dedicated Risk characterisation ratio 0.013 <0.01 <0.01 <0.01 <0.01
Man via Environment - Oral Contributing scenario controllin PROC8b Transfer of substance or acilities Method: TRA Worker v3 Route of exposure and type of effects nhalation, Systemic effects, ong Term nhalation, Local effects, Acute nhalation, Local effects, Acute Dermal, Systemic effects, ong Term	1.941 mg/kg bw/day         g worker exposure (1)         preparation (charging/discharging) from/to v         Exposure concentration         0.07 mg/m³         0.28 mg/m³         0.07 mg/m³         0.28 mg/m³         0.28 mg/m³         0.28 mg/m³         0.28 mg/m³         0.28 mg/m³         0.28 mg/m³	0.324 vessels/large containers at dedicated Risk characterisation ratio 0.013 <0.01 <0.01 <0.01 <0.01 0.343

Method: TRA Worker v3		
Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Inhalation, Systemic effects, Long Term	7 X 10 <sup>-4</sup> mg/m <sup>3</sup>	<0.01
Inhalation, Systemic effects, Acute	0.003 mg/m³	<0.01
Inhalation, Local effects, Long Term	7 X 10 <sup>-4</sup> 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 <sup>2</sup>	<0.01
Combined routes, Systemic effects, Long Term	-	0.034
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling w PROC10 Roller application or brushing	<b>orker exposure (3)</b> ŋ - Metal cleaner (degreaser, descaler, e	tch); 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 <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.692
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling w PROC7 Industrial spraying	orker exposure (4)	·
Method: TRA Worker v3		

Inhalation, Systemic effects, Acute	0.28 mg/m³	<0.01
Inhalation, Systemic effects, Long Term	0.07 mg/m³	0.013
Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Method: TRA Worker v3		
Contributing scenario controlling v PROC15 Use as laboratory reagent	vorker exposure (6)	
effects, Acute	-	50.01
Long Term Combined routes, Systemic		<0.01
Combined routes, Systemic effects,	-	0.344
Dermal, Local effects, Long Term	0.1 mg/cm <sup>2</sup>	0.1
Dermal, Systemic effects, Long Term	0.685 mg/kg bw/day	0.343
nhalation, Local effects, Acute	0.028 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.007 mg/m³	<0.01
nhalation, Systemic effects, Acute	0.028 mg/m³	<0.01
nhalation, Systemic effects, ₋ong Term	0.007 mg/m³	<0.01
Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Method: TRA Worker v3		
Contributing scenario controlling v PROC13 Treatment of articles by dip		
Combined routes, Systemic effects, Acute	-	<0.01
Combined routes, Systemic effects, Long Term	-	0.06
Dermal, Local effects, Long Term	0.005 mg/cm <sup>2</sup>	<0.01
Dermal, Systemic effects, Long Term	0.107 mg/kg bw/day	0.054
Inhalation, Local effects, Acute	0.14 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.035 mg/m³	<0.01
Inhalation, Systemic effects, Acute	0.14 mg/m <sup>3</sup>	<0.01
nhalation, Systemic effects, ∟ong Term	0.035 mg/m³	<0.01

Inhalation, Local effects, Long Term	0.07 mg/m³	<0.01
Inhalation, Local effects, Acute	0.28 mg/m <sup>3</sup>	<0.01
Dermal, Systemic effects, Long Term	0.017 mg/kg bw/day	<0.01
Dermal, Local effects, Long Term	0.005 mg/cm <sup>2</sup>	<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 scena	rio
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 ERC2 Formulation - water treatment	environmental exposure (1) and washing and cleaning products
Amounts used, Frequency and du	iration 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	$\geq 2 \times 10^3 \text{ m}^3/\text{days}$

Application of the STP sludge on agricultural soil	Yes
Conditions and measures related	to external treatment of waste for disposal
	ste treatment operations: No (low risk) (ERC based assessment demonstrating control isk assumed for waste life stage. Waste disposal according to national/local legislation
Other given operational condition	ns affecting environmental exposure
Receiving surface water flow	≥ 1.8 X 10 <sup>4</sup> m <sup>3</sup> /days
Contributing scenario controlling PROC8b Receiving and charging of	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and du	uration of use
Duration of activity	<8 hour(s)
Technical conditions and measur	es 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 condition	s affecting workers exposure
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )
Contributing scenario controlling PROC3 Mixing, dispersing, complet	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and de	uration of use
	33

Duration of activity	<8 hour(s)	
Technical conditions and measur	es 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 condition	ns affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	One hand face only (240 cm <sup>2</sup> )	
Contributing scenario controlling PROC5 Mixing, dispersing and com Product (article) characteristic	y worker exposure (3) upletion in open multistage batch process	
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and d	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measure	es 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 condition	ns affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
	1	

Skin surface potentially exposed	Two hands face (480 cm <sup>2</sup> )	
Contributing scenario controlling		
PROC8a Transfer in non-dedicated fa	1 17	
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and dur	ation of use	
Duration of activity	<8 hour(s)	
Technical conditions and measure	s 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 t	o 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 <sup>2</sup> )	
Contributing scenario controlling v PROC8b Transfer at dedicated facilit		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and dur	ation of use	
Duration of activity	<8 hour(s)	
Technical conditions and measure	s 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	35

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 condition	ns affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Contributing scenario controlling PROC9 Filling small containers in d		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and d	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measu	res 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 condition	ns affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands face (480 cm <sup>2</sup> )	
Contributing scenario controlling PROC8a Maintenance and cleaning		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
	1	36

Amounts used, Frequency and de	uration of use		
Duration of activity	<8 hour(s)	<8 hour(s)	
Technical conditions and measur	es to control dispersion from source to	wards the worker	
General ventilation	Good general ventilation (3-5 air chang	es 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 he	alth evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effe	ctiveness - Dermal: 95%]	
Respiratory protection	No. [Effectiveness - Inhalation: 0%]		
Eye Protection	Safety spectacles/goggles/full face shie	ld	
Other given operational condition	ns affecting workers exposure		
Place of use	Indoor use		
Process temperature (for solid)	Ambient		
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )		
Section 3: Exposure estimation a	nd reference to its source		
Contributing scenario controlling ERC2 Formulation - water treatmen	environmental exposure (1) t 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 <sup>-11</sup> mg/m <sup>3</sup>	<0.01	
Man via Environment - Oral	1.328 X 10 <sup>-4</sup> mg/kg bw/day	<0.01	
Contributing scenario controlling PROC8b Receiving and charging of	· · · · ·	1	
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 <sup>2</sup>	0.05
Combined routes, Systemic effects, Long Term	-	0.356
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling v PROC3 Mixing, dispersing, completion		
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/m <sup>3</sup>	<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 <sup>2</sup>	0.01
Combined routes, Systemic effects, Long Term	-	0.03
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling v PROC5 Mixing, dispersing and comp	vorker exposure (3) letion 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/m <sup>3</sup>	0.013
Inhalation, Local effects, Long Term	0.35 mg/m³	0.011
Inhalation, Local effects, Acute	1.4 mg/m³	0.013
	-	

Long Term		
Dermal, Local effects, Long Term	0.1 mg/cm <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.408
Combined routes, Systemic effects, Acute	-	0.013
Contributing scenario controlling we PROC8a Transfer in non-dedicated fac		
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/m <sup>3</sup>	0.013
Inhalation, Local effects, Long Term	0.35 mg/m³	0.011
Inhalation, Local effects, Acute	1.4 mg/m <sup>3</sup>	0.013
Dermal, Systemic effects, Long Term	0.685 mg/kg bw/day	0.343
Dermal, Local effects, Long Term	0.05 mg/cm <sup>2</sup>	0.05
Combined routes, Systemic effects, Long Term	-	0.408
Combined routes, Systemic effects, Acute	-	0.013
Contributing scenario controlling we PROC8b Transfer at dedicated facilitie		
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/m <sup>3</sup>	<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 <sup>2</sup>	0.05
Combined routes, Systemic effects, Long Term	-	0.356

effects, Acute Contributing scenario controlling wo	rkar avpasura (6)	
PROC9 Filling small containers in dedic		
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/m <sup>3</sup>	<0.01
Inhalation, Local effects, Long Term	0.07 mg/m³	<0.01
Inhalation, Local effects, Acute	0.28 mg/m <sup>3</sup>	<0.01
Dermal, Systemic effects, Long Term	0.343 mg/kg bw/day	0.172
Dermal, Local effects, Long Term	0.05 mg/cm <sup>2</sup>	0.05
Combined routes, Systemic effects, Long Term	-	0.185
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling wo PROC8a Maintenance and cleaning op		
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/m <sup>3</sup>	0.013
Inhalation, Local effects, Long Term	0.35 mg/m³	0.011
Inhalation, Local effects, Acute	1.4 mg/m <sup>3</sup>	0.013
Dermal, Systemic effects, Long Term	0.685 mg/kg bw/day	0.343
Dermal, Local effects, Long Term	0.05 mg/cm <sup>2</sup>	0.05
Combined routes, Systemic effects, Long Term	-	0.408
Combined routes, Systemic effects, Acute	-	0.013

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

Section 1: Title of exposure scenar	rio
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 e ERC2 Formulation	environmental exposure (1)
Amounts used, Frequency and du	ration 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 t	o municipal sewage treatment plant
Municipal STP	Yes. [Effectiveness - Water: 87.34%]
Discharge rate of STP	≥ 2 X 10 <sup>3</sup> m³/days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related t	o external treatment of waste for disposal
	e treatment operations: No (low risk) (ERC based assessment demonstrating control sk assumed for waste life stage. Waste disposal according to national/local legislation
Other given operational conditions	affecting environmental exposure
Receiving surface water flow	$\geq$ 1.8 X 10 <sup>4</sup> m <sup>3</sup> /days
Contributing scenario controlling and PROC8b Receiving and charging of t	• • • • • • • • • • • • • • • • • • • •
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and dur	ration of use 41/

Duration of activity	<8 hour(s)	
Technical conditions and measur	es 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 condition	s affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Contributing scenario controlling PROC3 Mixing, dispersing, complete Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and d	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measured	es 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 condition	s affecting workers exposure	
Place of use	Indoor use	

Skin surface potentially exposed	One hand face only (240 cm <sup>2</sup> )	
Contributing scenario controlling PROC5 Mixing, dispersing and comp	worker exposure (3) bletion in open multistage batch process	
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and du	ration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measure	es 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 condition	s affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands face (480 cm <sup>2</sup> )	
Contributing scenario controlling PROC8a Transfer in non-dedicated		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and du	ration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measure	es 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	43

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 condition	ns affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Contributing scenario controlling PROC8b Transfer at dedicated faci		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and d	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measu	res 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 condition	ns affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Contributing scenario controlling PROC9 Filling small containers in c		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
		44,

Amounts used, Frequency and de	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measur	res 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 condition	ns affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands face (480 cm <sup>2</sup> )	
Contributing scenario controlling PROC8a Maintenance and cleaning		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and de	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measur	res 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 condition	s affecting workers exposure	
Place of use	Indoor use	45

Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Section 3: Exposure estimation an	d reference to its source	
Contributing scenario controlling ERC2 Formulation	environmental exposure (1)	
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 <sup>-11</sup> mg/m <sup>3</sup>	<0.01
Man via Environment - Oral	1.328 X 10 <sup>-4</sup> mg/kg bw/day	<0.01
Contributing scenario controlling PROC8b Receiving and charging of		
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 <sup>2</sup>	0.05
Combined routes, Systemic effects, Long Term	-	0.356
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling PROC3 Mixing, dispersing, completion		
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 <sup>2</sup>	0.01
Combined routes, Systemic effects, Long Term	-	0.03
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling w PROC5 Mixing, dispersing and complete		
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/m <sup>3</sup>	0.013
Inhalation, Local effects, Long Term	0.35 mg/m³	0.011
Inhalation, Local effects, Acute	1.4 mg/m <sup>3</sup>	0.013
Dermal, Systemic effects, Long Term	0.685 mg/kg bw/day	0.343
Dermal, Local effects, Long Term	0.1 mg/cm <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.408
Combined routes, Systemic effects, Acute	-	0.013
Contributing scenario controlling w PROC8a Transfer in non-dedicated fac		
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/m <sup>3</sup>	0.013
Inhalation, Local effects,	0.35 mg/m <sup>3</sup>	0.011
Long Term		47

Inhalation, Local effects, Acute	1.4 mg/m <sup>3</sup>	0.013
Dermal, Systemic effects, Long Term	0.685 mg/kg bw/day	0.343
Dermal, Local effects, Long Term	0.05 mg/cm <sup>2</sup>	0.05
Combined routes, Systemic effects, Long Term	-	0.408
Combined routes, Systemic effects, Acute	-	0.013
Contributing scenario controlling wo 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/m <sup>3</sup>	<0.01
Inhalation, Local effects, Long Term	0.07 mg/m³	<0.01
Inhalation, Local effects, Acute	0.28 mg/m <sup>3</sup>	<0.01
Dermal, Systemic effects, Long Term	0.685 mg/kg bw/day	0.343
Dermal, Local effects, Long Term	0.05 mg/cm <sup>2</sup>	0.05
Combined routes, Systemic effects, Long Term	-	0.356
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling wo PROC9 Filling small containers in dedic		
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/m <sup>3</sup>	<0.01
Inhalation, Local effects, Long Term	0.07 mg/m³	<0.01
Inhalation, Local effects, Acute	0.28 mg/m <sup>3</sup>	<0.01
Dermal, Systemic effects, Long Term	0.343 mg/kg bw/day	0.172
Dermal, Local effects, Long Term	0.05 mg/cm <sup>2</sup>	0.05
		0.185 48

effects, Long Term		
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling w PROC8a Maintenance and cleaning o	,	
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 <sup>2</sup>	0.05
Combined routes, Systemic effects, Long Term	-	0.408
Combined routes, Systemic effects, Acute	-	0.013
Section 4: Guidance to DU to evaluate	ate whether he works inside the bound	daries set by the ES
No additional risk management measu workers.	ures, besides those that are mentioned al	bove, are needed to guarantee safe use for

## 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
<b>Contributing scenario controlling e</b> ERC6a Use at industrial site: Interme	
Amounts used, Frequency and dur	ation 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 t	o municipal sewage treatment plant
Municipal STP	Yes. [Effectiveness - Water: 87.34%]
Discharge rate of STP	$\geq$ 2 X 10 <sup>3</sup> m <sup>3</sup> /days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related t	o external treatment of waste for disposal
	e treatment operations: No (low risk) (ERC based assessment demonstrating control sk assumed for waste life stage. Waste disposal according to national/local legislation
Other given operational conditions	affecting environmental exposure
Receiving surface water flow	≥ 1.8 X 10 <sup>4</sup> m³/days
Contributing scenario controlling v PROC8a Transfer in non-dedicated fa	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in	Substance as such

Amounts used, Frequency and du	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measur	es 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 condition	s affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Elevated temperature < melting point	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	-
Contributing scenario controlling PROC8b Transfer at dedicated facil		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and du	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measur	es 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 condition	is affecting workers exposure	
Place of use	Indoor use	51

Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )
Contributing scenario controlling PROC8b Receiving and charging of	• • • • •
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and du	ration of use
Duration of activity	<8 hour(s)
Technical conditions and measure	es 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 condition	s affecting workers exposure
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )
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 du	ration of use
Duration of activity	<8 hour(s)
Technical conditions and measure	es 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 condition	ns 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 <sup>2</sup> )	
Contributing scenario controlling PROC2 Use in closed, continuous p	worker exposure (5) process with occasional controlled exposure	
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and d	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measur	es 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 condition	s 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 <sup>2</sup> )	
Contributing scenario controlling PROC3 Use in closed batch proces		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	53/

Amounts used, Frequency and du	iration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measur	es 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 condition	s 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 <sup>2</sup> )	
Contributing scenario controlling PROC4 Use in batch and other proc	worker exposure (7) ess (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 du	iration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measur	es 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 condition	s affecting workers exposure	
Place of use	Indoor use	
		54/

Process temperature (for solid)	Elevated temperature < melting point		
Skin surface potentially exposed	Two hands face (480 cm <sup>2</sup> )		
Contributing scenario controlling PROC15 Use as laboratory reagent	• • • • • • • • • • • • • • • • • • • •		
Product (article) characteristic			
Dustiness of material	Low		
Concentration of substance in mixture	Substance as such		
Amounts used, Frequency and du	iration of use		
Duration of activity	<8 hour(s)		
Technical conditions and measur	es to control dispersion from source t	owards the worker	
General ventilation	Basic general ventilation (1-3 air chan	ges 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 h	ealth evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Eff	ectiveness - Dermal: 80%]	
Respiratory protection	No. [Effectiveness - Inhalation: 0%]		
Eye Protection	Safety spectacles/goggles/full face sh	Safety spectacles/goggles/full face shield	
Other given operational condition	s 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 <sup>2</sup> )		
Section 3: Exposure estimation a	nd 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	
	0.004 mg/m <sup>3</sup>	<0.01	

Man via Environment - Oral	0.555 mg/kg bw/day	0.093
Contributing scenario controlling wo PROC8a Transfer in non-dedicated faci		
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 <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling wo 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/m <sup>3</sup>	<0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	<0.01
Inhalation, Local effects, Acute	0.4 mg/m <sup>3</sup>	<0.01
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.704
Combined routes, Systemic effects, Acute	-	<0.01

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/m <sup>3</sup>	<0.01
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.704
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling w PROC1 Use in closed process, no like		
• •	elihood of exposure	
	elihood of exposure	
Method: TRA Worker v3 Route of exposure and type of effects	Exposure Concentration	Risk characterisation ratio
Method: TRA Worker v3 Route of exposure and type of effects Inhalation, Systemic effects,		Risk characterisation ratio
Method: TRA Worker v3 Route of exposure and type of	Exposure concentration	
Method: TRA Worker v3 Route of exposure and type of effects Inhalation, Systemic effects, Long Term Inhalation, Systemic effects, Acute Inhalation, Local effects,	Exposure concentration 0.01 mg/m <sup>3</sup>	<0.01
Method: TRA Worker v3 Route of exposure and type of effects Inhalation, Systemic effects, Long Term Inhalation, Systemic effects, Acute Inhalation, Local effects, Long Term	Exposure concentration 0.01 mg/m <sup>3</sup> 0.04 mg/m <sup>3</sup>	<0.01
Method: TRA Worker v3 Route of exposure and type of effects Inhalation, Systemic effects, Long Term	Exposure concentration 0.01 mg/m <sup>3</sup> 0.04 mg/m <sup>3</sup> 0.01 mg/m <sup>3</sup>	<0.01 <0.01
Method: TRA Worker v3 Route of exposure and type of effects Inhalation, Systemic effects, Long Term Inhalation, Local effects, Acute Inhalation, Local effects, Acute Dermal, Systemic effects, Long Term	Exposure concentration 0.01 mg/m <sup>3</sup> 0.04 mg/m <sup>3</sup> 0.01 mg/m <sup>3</sup> 0.04 mg/m <sup>3</sup>	<0.01 <0.01 <0.01 <0.01
Method: TRA Worker v3 Route of exposure and type of effects Inhalation, Systemic effects, Long Term Inhalation, Local effects, Acute Inhalation, Local effects, Acute Dermal, Systemic effects, Long Term Dermal, Local effects, Long Term Combined routes, Systemic	Exposure concentration 0.01 mg/m <sup>3</sup> 0.04 mg/m <sup>3</sup> 0.01 mg/m <sup>3</sup> 0.04 mg/m <sup>3</sup> 0.04 mg/m <sup>3</sup> 0.007 mg/kg bw/day	<0.01 <0.01 <0.01 <0.01 <0.01 <0.01
Method: TRA Worker v3 Route of exposure and type of effects Inhalation, Systemic effects, Long Term Inhalation, Local effects, Acute Inhalation, Local effects, Acute Dermal, Systemic effects,	Exposure concentration 0.01 mg/m <sup>3</sup> 0.04 mg/m <sup>3</sup> 0.01 mg/m <sup>3</sup> 0.04 mg/m <sup>3</sup> 0.04 mg/m <sup>3</sup> 0.007 mg/kg bw/day	<0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01
Method: TRA Worker v3  Route of exposure and type of effects Inhalation, Systemic effects, Long Term Inhalation, Local effects, Acute Inhalation, Local effects, Acute Dermal, Systemic effects, Long Term Dermal, Local effects, Long Term Combined routes, Systemic effects, Long Term Combined routes, Systemic effects, Acute Contributing scenario controlling v	Exposure concentration 0.01 mg/m <sup>3</sup> 0.04 mg/m <sup>3</sup> 0.01 mg/m <sup>3</sup> 0.04 mg/m <sup>3</sup> 0.007 mg/kg bw/day 0.002 mg/cm <sup>2</sup> -	<0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01

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/m <sup>3</sup>	<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 <sup>2</sup>	0.04
Combined routes, Systemic effects, Long Term	-	0.139
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling v PROC3 Use 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/m <sup>3</sup>	<0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	<0.01
Inhalation, Local effects, Acute	0.4 mg/m <sup>3</sup>	<0.01
Dermal, Systemic effects, Long Term	0.138 mg/kg bw/day	0.069
Dermal, Local effects, Long Term	0.04 mg/cm <sup>2</sup>	0.04
Combined routes, Systemic effects, Long Term	-	0.088
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling v PROC4 Use in batch and other proce	vorker exposure (7) ess (synthesis) where opportunity for expos	sure arises
Method: TRA Worker v3		
	Exposure concentration	Risk characterisation ratio
Route of exposure and type of effects		
	0.5 mg/m³	0.094

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 <sup>2</sup>	0.2
Combined routes, Systemic effects, Long Term	-	0.78
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling w PROC15 Use as laboratory reagent	orker exposure (8)	
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/m <sup>3</sup>	<0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	<0.01
Inhalation, Local effects, Acute	0.4 mg/m <sup>3</sup>	<0.01
Dermal, Systemic effects, Long Term	0.068 mg/kg bw/day	0.034
Dermal, Local effects, Long Term	0.02 mg/cm <sup>2</sup>	0.02
Combined routes, Systemic effects, Long Term	-	0.053
Combined routes, Systemic effects, Acute	-	<0.01
Section 4: Guidance to DU to evaluate	ate whether he works inside the bound	daries set by the ES
No additional risk management measu workers.	res, besides those that are mentioned a	bove, are needed to guarantee safe use for

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

Section 1: Title of exposure scenar	rio
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
<b>Contributing scenario controlling e</b> ERC2 Formulation of water treatmen	
Amounts used, Frequency and dur	ration 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 t	o municipal sewage treatment plant
Municipal STP	Yes. [Effectiveness - Water: 87.34%]
Discharge rate of STP	≥ 2 X 10 <sup>3</sup> m <sup>3</sup> /days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related t	o external treatment of waste for disposal
	e treatment operations: No (low risk) (ERC based assessment demonstrating control sk assumed for waste life stage. Waste disposal according to national/local legislation
of risk with default conditions. Low ris is sufficient.)	

Contributing scenario controlling PROC1 Use in closed process, no lil	• • • • • • • • • • • • • • • • • • • •
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and du	ration of use
Duration of activity	<8 hour(s)
Technical conditions and measure	es 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 condition	s 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 <sup>2</sup> )
<b>Contributing scenario controlling</b> PROC2 Use in closed, continuous p	worker exposure (2) rocess with occasional controlled exposure
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and du	ration of use
Duration of activity	<8 hour(s)
Technical conditions and measure	es 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 t	o 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	s 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 <sup>2</sup> )	
Contributing scenario controlling v PROC4 Use in batch and other proce	worker exposure (3) ess (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 du	ration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measure	s 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 t	o 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 <sup>2</sup> )	
Contributing scenario controlling v PROC8b Receiving and charging of t	• • • • • • • • • • • • • • • • • • • •	
Product (article) characteristic		
Dustiness of material	Low	

Amounts used, Frequency and d	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measu	res 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 condition	ns affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Elevated temperature < melting point	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Contributing scenario controlling PROC3 Mixing, dispersing, comple		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and d	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measu	res 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 condition	ns 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 <sup>2</sup> )
Contributing scenario controlling PROC5 Mixing, dispersing and comp	worker exposure (6) oletion in open multistage batch process
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and du	ration of use
Duration of activity	<8 hour(s)
Technical conditions and measure	es 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 condition	s 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 <sup>2</sup> )
Contributing scenario controlling PROC8a Transfer in non-dedicated	• • • • • •
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and du	ration of use
Duration of activity	<8 hour(s)
Technical conditions and measure	es 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%]
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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 cm²)         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         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 Local exhaust ventilation	Semi-closed process with occasional controlled exposure           No. [Effectiveness - Inhalation: 0%]	
Hand protection/ Skin protectionWear impervious gloves (EN374). [Effectiveness - Dermal: 90%]Respiratory protectionNo. [Effectiveness - Inhalation: 0%]Eye ProtectionSafety spectacles/goggles/full face shieldOther given operational conditions affecting workers exposurePlace of useIndoor useProcess temperature (for solid)Elevated temperature < melting point	General ventilation	Basic general ventilation (1-3 air changes per hour)	
Hand protection/ Skin protectionWear impervious gloves (EN374). [Effectiveness - Dermal: 90%]Respiratory protectionNo. [Effectiveness - Inhalation: 0%]Eye ProtectionSafety spectacles/goggles/full face shieldOther given operational conditions affecting workers exposurePlace of useIndoor useProcess temperature (for solid)Elevated temperature < melting point			
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		es to control dispersion from source towards the worker	
Hand protection/ Skin protectionWear impervious gloves (EN374). [Effectiveness - Dermal: 90%]Respiratory protectionNo. [Effectiveness - Inhalation: 0%]Eye ProtectionSafety spectacles/goggles/full face shieldOther given operational conditions affecting workers exposurePlace of useIndoor useProcess temperature (for solid)Elevated temperature < melting point	Duration of activity	<8 hour(s)	
Hand protection/ Skin protectionWear impervious gloves (EN374). [Effectiveness - Dermal: 90%]Respiratory protectionNo. [Effectiveness - Inhalation: 0%]Eye ProtectionSafety spectacles/goggles/full face shieldOther given operational conditions affecting workers exposurePlace of useIndoor useProcess temperature (for solid)Elevated temperature < melting point	Amounts used, Frequency and du	ration of use	
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			
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		Substance as such	
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			
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	Dustiness of material	Low	
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	Product (article) characteristic		
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	PROC8b Transfer at dedicated facili	ties	
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			
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         Place of use       Indoor use         Process temperature (for solid)       Elevated temperature < melting point			
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         Place of use       Indoor use         Process temperature (for solid)       Elevated temperature < melting point	Contributing scenario controlling	worker exposure (8)	
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	Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
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	Process temperature (for solid)		
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			
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			
Hand protection/ Skin protection       Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]         Respiratory protection       No. [Effectiveness - Inhalation: 0%]	Other given operational condition	s affecting workers exposure	
Hand protection/ Skin protection Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]	Eye Protection	Safety spectacles/goggles/full face shield	
Hand protection/ Skin protection       Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]	Respiratory protection	No. [Effectiveness - Inhalation: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation			
	Conditions and measures related	to personal protection, hygiene and health evaluation	
Occupational Health and Safety Advanced Management System	Management System		

Concentration of automatic	Substance as such
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and du	uration of use
Duration of activity	<8 hour(s)
Technical conditions and measur	es 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 condition	is 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 <sup>2</sup> )
Contributing scenario controlling PROC8a Maintenance and cleaning	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and du	uration of use
Duration of activity	<8 hour(s)
Technical conditions and measur	es 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	s affecting workers exposure
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )
Contributing scenario controlling PROC15 Use as laboratory reagent	worker exposure (11)
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and du	ration of use
Duration of activity	<8 hour(s)
Technical conditions and measure	s 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 t	o 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	s 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 <sup>2</sup> )
Contributing scenario controlling PROC21 Low energy manipulation o	worker exposure (12) f 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 du	ration of use
Duration of activity	<8 hour(s)
	1

Technical conditions and measure	es to control dispersion from source to	vards the worker		
General ventilation	Basic general ventilation (1-3 air change	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 hea	alth evaluation		
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effect	tiveness - Dermal: 90%]		
Respiratory protection	No. [Effectiveness - Inhalation: 0%]			
Other given operational condition	s affecting workers exposure			
Place of use	Indoor use			
Process temperature (for solid)	Ambient			
Skin surface potentially exposed	Two hands and forearms (1980 cm <sup>2</sup> )			
Section 3: Exposure estimation ar	d reference to its source			
Contributing scenario controlling ERC2 Formulation of water treatmer	environmental exposure (1) It 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/m³	<0.01		
Man via Environment - Oral	0.417 mg/kg bw/day	0.07		
Contributing scenario controlling PROC1 Use in closed process, no lil				
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/m <sup>3</sup>	<0.01		
Inhalation, Local effects, Long Term	0.01 mg/m³	<0.01		

Dermal, Systemic effects, Long Term         0.007 mg/kg bw/day         <0.01			
Long Term         0.002 mg/cm <sup>2</sup> <0.01           Combined routes, Systemic effects, Long Term         -         <0.01	Inhalation, Local effects, Acute	0.04 mg/m <sup>3</sup>	<0.01
Combined routes, Systemic effects, Long Term         -         <0.01	Dermal, Systemic effects, Long Term	0.007 mg/kg bw/day	<0.01
effects, Long Term       <0.01	Dermal, Local effects, Long Term	0.002 mg/cm <sup>2</sup>	<0.01
effects, Acute       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 effects         Inhalation, Systemic effects, Long Term       0.01 mg/m³       <0.01	Combined routes, Systemic effects, Long Term	-	<0.01
PROC2 Use in closed, continuous process with occasional controlled exposure           Method: TRA Worker v3           Route of exposure and type of effects         Exposure concentration (nhalation, Systemic effects, Long Term         Risk characterisation ratio           Inhalation, Systemic effects, Acute         0.01 mg/m³         <0.01	Combined routes, Systemic effects, Acute	-	<0.01
Route of exposure and type of effectsExposure concentrationRisk characterisation ratioInhalation, Systemic effects, Long Term0.01 mg/m³<0.01		• • • • •	9
effectsNumber of the second secon	Method: TRA Worker v3		
Long TermImalationInhalation, Systemic effects, Acute0.04 mg/m³Inhalation, Local effects, Long Term0.01 mg/m³Inhalation, Local effects, Acute0.04 mg/m³Inhalation, Local effects, Acute0.04 mg/m³Dermal, Systemic effects, Long Term0.274 mg/kg bw/dayDermal, Local effects, Long Term0.04 mg/cm²Dermal, Local effects, Long Term0.04 mg/cm²Combined routes, Systemic effects, Long Term-Combined routes, Systemic effects, Acute-Contributing scenario controlling worker exposure (3) PROC4 Use in batch and other process (synthesis) where opportunity for exposure arisesMethod: TRA Worker v3Exposure concentration effects, Long TermRoute of exposure and type of effects, Long TermExposure concentration 2 mg/m³Inhalation, Systemic effects, Long Term0.5 mg/m³Inhalation, Systemic effects, Long Term0.5 mg/m³Inhalation, Local effects, Acute2 mg/m³Dermal, Local effects, Acute2 mg/m³Inhalation, Local effects, Acute2 mg/m³Inhalation, Local effects, Acute2 mg/m³Inhalation, Local effects, Acute2 mg/m³Dermal, Systemic effects, Long Term0.5 mg/m³Inhalation, Local effects, Acute2 mg/m³Inhalation, Local effects, Acute2 mg/m³Inhalation, Local effects, Acute2 mg/m³Inhalation, Local effects, Acute2 mg/m³Dermal, Systemic effects, Long Term0.019Inhalation, Local effects, Acute2 mg/m³ <td>Route of exposure and type of effects</td> <td>Exposure concentration</td> <td>Risk characterisation ratio</td>	Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Inhalation, Local effects, Long Term0.01 mg/m³<0.01Inhalation, Local effects, Acute0.04 mg/m³<0.01	Inhalation, Systemic effects, Long Term	0.01 mg/m³	<0.01
Long TermImage: Constraint of the second	Inhalation, Systemic effects, Acute	0.04 mg/m <sup>3</sup>	<0.01
Dermal, Systemic effects, Long Term0.274 mg/kg bw/day0.137Dermal, Local effects, Long Term0.04 mg/cm²0.04Combined routes, Systemic effects, Long Term-0.139Combined routes, Systemic effects, Acute-<0.01	Inhalation, Local effects, Long Term	0.01 mg/m³	<0.01
Long TermImage: constraint of the second	Inhalation, Local effects, Acute	0.04 mg/m³	<0.01
Combined routes, Systemic effects, Long Term0.139Combined routes, Systemic effects, Acute-0.139Contributing scenario controlling worker exposure (3) PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises-Method: TRA Worker v3Route of exposure and type of 	Dermal, Systemic effects, Long Term	0.274 mg/kg bw/day	0.137
effects, Long TermCombined routes, Systemic effects, Acute-<0.01	Dermal, Local effects, Long Term	0.04 mg/cm <sup>2</sup>	0.04
effects, AcuteContributing scenario controlling worker exposure (3) PROC4 Use in batch and other process (synthesis) where opportunity for exposure arisesMethod: TRA Worker v3Exposure concentration effectsRisk characterisation ratioInhalation, Systemic effects, Long Term0.5 mg/m³0.094Inhalation, Systemic effects, Acute2 mg/m³0.019Inhalation, Local effects, Acute2 mg/m³0.016Inhalation, Local effects, Acute2 mg/m³0.019Inhalation, Local effects, Acute2 mg/m³0.019Inhalation, Local effects, Acute2 mg/m³0.019Inhalation, Local effects, Acute2 mg/m³0.019Inhalation, Local effects, Acute2 mg/m³0.019Dermal, Systemic effects, Long Term1.372 mg/kg bw/day0.686	Combined routes, Systemic effects, Long Term	-	0.139
PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises         Method: TRA Worker v3       Exposure concentration       Risk characterisation ratio         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, Acute       2 mg/m³       0.016         Inhalation, Local effects, Acute       2 mg/m³       0.019         Inhalation, Local effects, Acute       1.372 mg/kg bw/day       0.686	Combined routes, Systemic effects, Acute	-	<0.01
Route of exposure and type of effectsExposure concentrationRisk characterisation ratioInhalation, Systemic effects, Long Term0.5 mg/m³0.094Inhalation, Systemic effects, Acute2 mg/m³0.019Inhalation, Local effects, Long Term0.5 mg/m³0.016Inhalation, Local effects, Acute2 mg/m³0.019Inhalation, Local effects, Acute2 mg/m³0.019Inhalation, Local effects, Acute1.372 mg/kg bw/day0.686			sure arises
effectsInhalation, Systemic effects, Long Term0.5 mg/m³0.094Inhalation, Systemic effects, Acute2 mg/m³0.019Inhalation, Local effects, Long Term0.5 mg/m³0.016Inhalation, Local effects, Acute2 mg/m³0.016Inhalation, Local effects, Acute2 mg/m³0.019Inhalation, Local effects, Acute2 mg/m³0.019Inhalation, Local effects, Acute1.372 mg/kg bw/day0.686	Method: TRA Worker v3		
Long TermInhalation, Systemic effects, Acute2 mg/m³0.019Inhalation, Local effects, Long Term0.5 mg/m³0.016Inhalation, Local effects, Acute2 mg/m³0.019Inhalation, Local effects, Acute2 mg/m³0.019Dermal, Systemic effects, Long Term1.372 mg/kg bw/day0.686	Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Inhalation, Local effects, Long Term0.5 mg/m³0.016Inhalation, Local effects, Acute2 mg/m³0.019Dermal, Systemic effects, Long Term1.372 mg/kg bw/day0.686	Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Long Term     Inhalation, Local effects, Acute     2 mg/m <sup>3</sup> 0.019       Dermal, Systemic effects, Long Term     1.372 mg/kg bw/day     0.686	Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, 1.372 mg/kg bw/day 0.686 Long Term	Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Long Term	Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Local effects, Long Term 0.2 mg/cm <sup>2</sup> 0.2	Dermal, Systemic effects, Long Term	1.372 mg/kg bw/day	0.686
	Dermal, Local effects, Long Term	0.2 mg/cm <sup>2</sup>	0.2

Combined routes, Systemic effects, Long Term	-	0.78
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling we PROC8b Receiving and charging of the	• • • • •	
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/m <sup>3</sup>	<0.01
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.704
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling we PROC3 Mixing, dispersing, completion		
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/m <sup>3</sup>	<0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	<0.01
Inhalation, Local effects, Acute	0.4 mg/m <sup>3</sup>	<0.01
Dermal, Systemic effects, Long Term	0.069 mg/kg bw/day	0.034
Dermal, Local effects, Long Term	0.02 mg/cm <sup>2</sup>	0.02
Combined routes, Systemic effects, Long Term	-	0.053
Combined routes, Systemic	-	<0.01

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/m <sup>3</sup>	0.019
Dermal, Systemic effects, ₋ong Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.2 mg/cm <sup>2</sup>	0.2
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling w PROC8a Transfer in non-dedicated fa	• • • • • • • • • • • • • • • • • • • •	
Method: TRA Worker v3		
Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
nhalation, Systemic effects, ₋ong 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 <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.779

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/m <sup>3</sup>	<0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	<0.01
Inhalation, Local effects, Acute	0.4 mg/m <sup>3</sup>	<0.01
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.704
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling we PROC9 Filling small containers in dedi		
Method: TRA Worker v3		
Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Inhalation, Systemic effects, Long Term	0.1 mg/m <sup>3</sup>	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m <sup>3</sup>	<0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	<0.01
Inhalation, Local effects, Acute	0.4 mg/m <sup>3</sup>	<0.01
Dermal, Systemic effects, Long Term	0.686 mg/kg bw/day	0.343
Dermal, Local effects, Long Term	0.1 mg/cm <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.362
, 5		

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 <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling wo PROC15 Use as laboratory reagent	rker exposure (11)	
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/m <sup>3</sup>	<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 <sup>2</sup>	0.02
Combined routes, Systemic effects, Long Term	-	0.053

Contributing scenario controlling wo PROC21 Low energy manipulation of su	• • • •	ticles
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 <sup>2</sup>	0.01
Combined routes, Systemic effects, Long Term	-	0.329
Combined routes, Systemic effects, Acute	-	0.038
Section 4: Guidance to DU to evaluat	e whether he works inside the bound	daries set by the ES
No additional risk management measur workers.	es, besides those that are mentioned a	bove, are needed to guarantee safe use for

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

Section 1: Title of exposure scena	ario
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 74/

	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 ERC7 Use at industrial site	environmental exposure (1)
Amounts used, Frequency and du	uration 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 <sup>3</sup> m <sup>3</sup> /days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related	to external treatment of waste for disposal
	ste treatment operations: No (low risk) (ERC based assessment demonstrating control isk assumed for waste life stage. Waste disposal according to national/local legislation
Other given operational condition	as affecting environmental exposure
Receiving surface water flow	≥ 1.8 X 10 <sup>4</sup> m <sup>3</sup> /days
Contributing scenario controlling PROC2 Use/production of water tre controlled exposure	worker exposure (1) atment chemicals or washing and cleaning products in closed system with occasional
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and du	uration of use
Duration of activity	<8 hour(s)
Technical conditions and measur	es 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 75

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 condition	s affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands face (480 cm <sup>2</sup> )	
Contributing scenario controlling PROC8b Raw material receipt and		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	>25%	
Solid in solid mixtures	Yes	
Amounts used, Frequency and de	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measur	es 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 condition	ns affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Contributing scenario controlling PROC4 Use in batch and other proc	worker exposure (3) cess (synthesis) where opportunity for exposure arises	
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in	>25%	76

mixture	
	Vec.
Solid in solid mixtures	Yes
Amounts used, Frequency and du	iration of use
Duration of activity	<8 hour(s)
Technical conditions and measur	es 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 condition	s affecting workers exposure
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm <sup>2</sup> )
Contributing scenario controlling PROC5 Preparation of water treatm	worker exposure (4) ent 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 du	iration of use
Duration of activity	<8 hour(s)
Technical conditions and measur	es 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
	4
Conditions and measures related	to personal protection, hygiene and health evaluation
Conditions and measures related Hand protection/ Skin protection	to personal protection, hygiene and health evaluation Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]

Eye Protection	Safety spectacles/goggles/full face shield	
Other given operational condition	s affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands face (480 cm <sup>2</sup> )	
<b>Contributing scenario controlling</b> PROC14 Preparation production (get	• • • • •	
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	>25%	
Solid in solid mixtures	Yes	
Amounts used, Frequency and du	Iration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measur	es 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 condition	s affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands face (480 cm <sup>2</sup> )	
Contributing scenario controlling PROC21 Low energy manipulation of	worker exposure (6) 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 du	iration of use	70/
		78/2

Duration of activity	<8 hour(s)	
Technical conditions and measu	res 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	t o 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 condition	ns affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands and forearms (1980 cm <sup>2</sup> )	
Contributing scenario controlling PROC8a Batch loading of equipme		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	>25%	
Solid in solid mixtures	Yes	
Amounts used, Frequency and d	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measu	res 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	t o 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 condition	ns affecting workers exposure	
Place of use	Indoor use	

Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Contributing scenario controlling PROC8a Batch loading of equipme		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	>25%	
Solid in solid mixtures	Yes	
Amounts used, Frequency and d	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measured	res 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 condition	s affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Contributing scenario controlling PROC8a Manual cleaning and main		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	5-25%	
Solid in solid mixtures	Yes	
Amounts used, Frequency and d	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measure	res 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 hea	Ith evaluation
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effect	tiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]	
Eye Protection	Safety spectacles/goggles/full face shield	
Other given operational condition	s affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Section 3: Exposure estimation ar	nd reference to its source	
Contributing scenario controlling ERC7 Use at industrial site	environmental exposure (1)	
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 <sup>-5</sup> mg/m <sup>3</sup>	<0.01
Man via Environment - Oral	0.009 mg/kg bw/day	<0.01
Contributing scenario controlling PROC2 Use/production of water trea controlled exposure Method: TRA Worker v3	worker exposure (1) atment chemicals or washing and cleaning	products in closed system with occasional
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/m <sup>3</sup>	<0.01
Inhalation, Local effects, Long Term	0.01 mg/m <sup>3</sup>	<0.01

Dermal, Systemic effects, Long Term	0.137 mg/kg bw/day	0.068
Dermal, Local effects, Long Term	0.02 mg/cm <sup>2</sup>	0.02
Combined routes, Systemic effects, Long Term	-	0.07
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling w PROC8b Raw material receipt and tran		
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/m <sup>3</sup>	<0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	<0.01
Inhalation, Local effects, Acute	0.4 mg/m <sup>3</sup>	<0.01
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.704
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling we PROC4 Use in batch and other proces	orker exposure (3) s (synthesis) where opportunity for expo	sure 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 <sup>2</sup>	0.1
Combined routes, Systemic	-	0.437
effects, Long Term		8

effects, Acute	-	0.019
Contributing scenario controlling wo PROC5 Preparation of water treatment		ducts 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/m <sup>3</sup>	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 <sup>2</sup>	0.2
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling wo PROC14 Preparation production (gener		
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
-	0.1 mg/m³ 0.4 mg/m³	<0.019
Long Term	-	
Long Term Inhalation, Systemic effects, Acute Inhalation, Local effects,	0.4 mg/m³	<0.01
Long Term Inhalation, Systemic effects, Acute Inhalation, Local effects, Long Term	0.4 mg/m <sup>3</sup> 0.1 mg/m <sup>3</sup>	<0.01 <0.01
Long Term       Inhalation, Systemic effects, Acute         Inhalation, Local effects, Long Term       Inhalation, Local effects, Acute         Dermal, Systemic effects,       Inhalation, Local effects, Acute	0.4 mg/m <sup>3</sup> 0.1 mg/m <sup>3</sup> 0.4 mg/m <sup>3</sup>	<0.01 <0.01 <0.01
Long Term       Inhalation, Systemic effects, Acute         Inhalation, Local effects, Long Term       Inhalation, Local effects, Acute         Dermal, Systemic effects, Long Term       Inhalation, Local effects, Acute	0.4 mg/m <sup>3</sup> 0.1 mg/m <sup>3</sup> 0.4 mg/m <sup>3</sup> 0.343 mg/kg bw/day	<0.01 <0.01 <0.01 0.172
Long TermInhalation, Systemic effects, AcuteInhalation, Local effects, Long TermInhalation, Local effects, AcuteDermal, Systemic effects, Long TermDermal, Local effects, Long TermCombined routes, Systemic	0.4 mg/m <sup>3</sup> 0.1 mg/m <sup>3</sup> 0.4 mg/m <sup>3</sup> 0.343 mg/kg bw/day	<0.01 <0.01 <0.01 0.172 0.05
Long Term       Inhalation, Systemic effects, Acute         Inhalation, Local effects,       Inhalation, Local effects,         Long Term       Inhalation, Local effects, Acute         Dermal, Systemic effects,       Inhalation, Local effects, Long Term         Dermal, Local effects, Long Term       Inhalation, Local effects, Long Term         Combined routes, Systemic effects, Long Term       Inhalation, Local effects, Long Term	0.4 mg/m <sup>3</sup> 0.1 mg/m <sup>3</sup> 0.4 mg/m <sup>3</sup> 0.343 mg/kg bw/day 0.05 mg/cm <sup>2</sup> - -	<0.01 <0.01 <0.01 0.172 0.05 0.19 <0.01

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 <sup>2</sup>	0.01
Combined routes, Systemic effects, Long Term	-	0.329
Combined routes, Systemic effects, Acute	-	0.038
Contributing scenario controlling w PROC8a Batch loading of equipment		
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/m <sup>3</sup>	0.013
Dermal, Systemic effects,	1.371 mg/kg bw/day	0.686
	0.1 mg/cm <sup>2</sup>	0.1
Long Term Dermal, Local effects, Long Term Combined routes, Systemic	0.1 mg/cm <sup>2</sup> -	0.1 0.751
Long Term Dermal, Local effects, Long Term	0.1 mg/cm <sup>2</sup> - -	
Long Term Dermal, Local effects, Long Term Combined routes, Systemic effects, Long Term Combined routes, Systemic	- - vorker exposure (8)	0.751
Long Term Dermal, Local effects, Long Term Combined routes, Systemic effects, Long Term Combined routes, Systemic effects, Acute Contributing scenario controlling v	- - vorker exposure (8)	0.751
Long Term Dermal, Local effects, Long Term Combined routes, Systemic effects, Long Term Combined routes, Systemic effects, Acute Contributing scenario controlling w PROC8a Manual cleaning and mainter	- - vorker exposure (8)	0.751
Long Term Dermal, Local effects, Long Term Combined routes, Systemic effects, Long Term Combined routes, Systemic effects, Acute Contributing scenario controlling w PROC8a Manual cleaning and mainte Method: TRA Worker v3 Route of exposure and type of	- - vorker exposure (8) enance of equipment	0.751

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 <sup>2</sup>	0.06
Combined routes, Systemic effects, Long Term	-	0.468
Combined routes, Systemic effects, Acute	-	0.012
Section 4: Guidance to DU to evalu	uate whether he works inside the bound	daries 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 <sup>-6</sup> tonnes/day	
Percentage of tonnage used at regional scale	10%	
Conditions and measures related	o municipal sewage treatment plant	
Municipal STP	Yes. [Effectiveness - Water: 87.34%]	
Discharge rate of STP	≥ 2 X 10 <sup>3</sup> m³/days	

Application of the STP sludge on agricultural soil	Yes	
Conditions and measures related	to external treatment of waste for disposal	
	te treatment operations: No (low risk) (ERC based assessment demonstrating control sk assumed for waste life stage. Waste disposal according to national/local legislation	
Other given operational conditions	s affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10 <sup>4</sup> m³/days	
Contributing scenario controlling PROC8b Raw material receipt and tr		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	>25%	
Solid in solid mixtures	Yes	
Amounts used, Frequency and du	ration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measure	s 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	s affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Contributing scenario controlling PROC5 Batch or other process with		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	>25%	

Solid in solid mixtures	Yes	
Amounts used, Frequency and d	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measur	res 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 condition	ns affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands face (480 cm <sup>2</sup> )	
Contributing scenario controlling PROC21 Low energy manipulation	worker exposure (3) 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 d	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measured	es 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%]	

Other given operational condition	s affecting workers exposure		
Place of use	Indoor use		
Process temperature (for solid)	Ambient		
Skin surface potentially exposed	Two hands and forearms (1980 cm <sup>2</sup> )		
Contributing scenario controlling PROC8a Transfer in non-dedicated			
Product (article) characteristic			
Dustiness of material	Low		
Concentration of substance in mixture	>25%		
Solid in solid mixtures	Yes		
Amounts used, Frequency and du	iration of use		
Duration of activity	<8 hour(s)		
Technical conditions and measur	es to control dispersion from source tov	vards the worker	
General ventilation	Basic general ventilation (1-3 air change	es per hour)	
Containment	No.		
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]		
Occupational Health and Safety Management System	Basic	Basic	
Conditions and measures related	to personal protection, hygiene and hea	Ith evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effect	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]	
Respiratory protection	No. [Effectiveness - Inhalation: 0%]		
Eye Protection	Safety spectacles/goggles/full face shiel	Safety spectacles/goggles/full face shield	
Other given operational condition	s affecting workers exposure		
Place of use	Indoor use	Indoor use	
Process temperature (for solid)	Ambient		
Skin surface potentially exposed	Two hands (960 cm²)		
Section 3: Exposure estimation a	nd reference to its source		
Contributing scenario controlling ERC8a Professional use in water tre			
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 <sup>-4</sup> mg/L	<0.01	

Sea water	2.869 X 10 <sup>-5</sup> mg/L	<0.01
Sewage treatment plant	3.481 X 10 <sup>-4</sup> mg/L	<0.01
Man via Environment - Inhalation	2.912 X 10 <sup>-11</sup> mg/m <sup>3</sup>	<0.01
Man via Environment - Oral	7.299 X 10 <sup>-₅</sup> mg/kg bw/day	<0.01
Contributing scenario controlling w PROC8b Raw material receipt and tra		
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 <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling w PROC5 Batch or other process with o	• • • • •	
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/m <sup>3</sup>	0.038
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.2 mg/cm <sup>2</sup>	0.2
Combined routes, Systemic	-	0.873
effects, Long Term		

coute of exposure and type of		
ffects	Exposure concentration	Risk characterisation ratio
nhalation, Systemic effects, .ong Term	3 mg/m³	0.563
nhalation, Systemic effects, Acute	12 mg/m³	0.115
nhalation, Local effects, .ong Term	3 mg/m³	0.094
nhalation, Local effects, Acute	12 mg/m³	0.115
Dermal, Systemic effects, .ong Term	0.283 mg/kg bw/day	0.142
Dermal, Local effects, Long Term	0.01 mg/cm <sup>2</sup>	0.01
Combined routes, Systemic iffects, Long Term	-	0.704
Combined routes, Systemic ffects, Acute	-	0.115
Contributing scenario controlling w PROC8a Transfer in non-dedicated fa		
/lethod: TRA Worker v3		
Route of exposure and type of iffects	Exposure concentration	Risk characterisation ratio
nhalation, Systemic effects, .ong Term	0.5 mg/m³	0.094
nhalation, Systemic effects, Acute	2 mg/m <sup>3</sup>	0.019
nhalation, Local effects, .ong Term	0.5 mg/m³	0.016
nhalation, Local effects, Acute	2 mg/m <sup>3</sup>	0.019
Dermal, Systemic effects, .ong Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm <sup>2</sup>	0.1
Combined routes, Systemic iffects, Long Term	-	0.779
		0.019

### 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 of ERC8a Consumer water treatment as		
Amounts used, Frequency and du	ration of use	
Daily wide dispersive use	≤ 3.575 X 10 <sup>-5</sup> tonnes/day	
Percentage of tonnage used at regional scale	10%	
Conditions and measures related t	o municipal sewage treatment plant	
Municipal STP	Yes. [Effectiveness - Water: 87.34%]	
Discharge rate of STP	≥ 2 X 10 <sup>3</sup> m <sup>3</sup> /days	
Application of the STP sludge on agricultural soil	Yes	
Conditions and measures related t	o external treatment of waste for disposal	
	te treatment operations: No (low risk) (ERC based assessment demonstrating control sk assumed for waste life stage. Waste disposal according to national/local legislation	
Other given operational conditions	s affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10 <sup>4</sup> m <sup>3</sup> /days	
Contributing scenario controlling of PC36 Water softeners	consumer exposure (1)	
Product (article) characteristic		
Product/ Article subcategory	No value	
Contributing scenario controlling	consumer exposure (2) 91/	

Product (article) characteristic		
Product/ Article subcategory	Cleaners, liquids (all purposes cleaners, cleaners, carpet cleaners, metal cleaner	
Concentration of substance in mixture	0.8 g/g "Concentration of the substance in the p (substance as such) for assessment pur	•
Oral contact foreseen	No.	
Amounts used, Frequency and du	uration 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 consu	mers exposure	
Body parts potentially exposed	Fingertips	
Dermal transfer factor	1	
Contributing scenario controlling PC37 Water treatment chemicals	consumer exposure (3)	
Product (article) characteristic		
Product/ Article subcategory	No value	
Contributing scenario controlling PC2 Adsorbents	consumer exposure (4)	
Product (article) characteristic		
Product/ Article subcategory	No value	
Section 3: Exposure estimation a	nd reference to its source	
Contributing scenario controlling ERC8a Consumer water treatment		
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 X 10 <sup>-4</sup> mg/L	<0.01
Sea water	4.746 X 10⁻⁵ mg/L	<0.01
Sewage treatment plant	0.002 mg/L	<0.01
Man via Environment - Inhalation	3.011 X 10 <sup>-11</sup> mg/m <sup>3</sup>	<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/m <sup>3</sup>	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 of PC37 Water treatment chemicals	onsumer exposure (3)	
Not available		
Contributing scenario controlling of PC2 Adsorbents	onsumer exposure (4)	
Not available		
Section 4: Guidance to DU to evalu	ate whether he works inside the bound	daries set by the ES
No odditional viels were very sub-	una hasidas these that are manificated at	

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 ERC2 Formulation of preparations	environmental exposure (1)
Amounts used, Frequency and du	ration 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	$\geq 2 \times 10^3 \text{ m}^3/\text{days}$
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related	to external treatment of waste for disposal
	te treatment operations: No (low risk) (ERC based assessment demonstrating control sk assumed for waste life stage. Waste disposal according to national/local legislation
Other given operational condition	s affecting environmental exposure
Receiving surface water flow	≥ 1.8 X 10 <sup>4</sup> m³/days
Contributing scenario controlling PROC1 Use in closed process, no lii	,
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such

Amounts used, Frequency and de	uration of use	
Duration of activity	<8 hour(s)	_
Technical conditions and measur	es 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 condition	s 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 <sup>2</sup> )	
Contributing scenario controlling PROC2 Use in closed, continuous p	worker exposure (2) process with occasional controlled exposure	
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and de	iration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measur	es 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 condition	s 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 <sup>2</sup> )	
Contributing scenario controlling PROC4 Use in batch and other pro-	worker exposure (3) cess (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 de	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measu	res 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 condition	s 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 <sup>2</sup> )	
Contributing scenario controlling PROC8b Receiving and charging o		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and de	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measur	res 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	96/

Management System		
	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 condition	is affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Elevated temperature < melting point	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Contributing scenario controlling PROC3 Mixing, dispersing, complet		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and du	iration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measur	es 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 condition	s 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 <sup>2</sup> )	
Contributing scenario controlling PROC5 Mixing, dispersing and com	worker exposure (6) pletion in open multistage batch process	
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	97/2
	1	

	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measured	res 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 condition	ns 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 <sup>2</sup> )	
Contributing scenario controlling PROC8a Transfer in non-dedicated		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in	Substance as such	
mixture		
mixture Amounts used, Frequency and de	uration of use	
	vration of use	
Amounts used, Frequency and d Duration of activity		
Amounts used, Frequency and d Duration of activity	<8 hour(s)	
Amounts used, Frequency and de Duration of activity Technical conditions and measure	<8 hour(s) res to control dispersion from source towards the worker	
Amounts used, Frequency and de Duration of activity Technical conditions and measure General ventilation	<pre>&lt;8 hour(s) res to control dispersion from source towards the worker Basic general ventilation (1-3 air changes per hour)</pre>	
Amounts used, Frequency and de Duration of activity Technical conditions and measure General ventilation Containment	<8 hour(s) res to control dispersion from source towards the worker Basic general ventilation (1-3 air changes per hour) No.	
Amounts used, Frequency and de Duration of activity Technical conditions and measure General ventilation Containment Local exhaust ventilation Occupational Health and Safety Management System	<8 hour(s) res to control dispersion from source towards the worker Basic general ventilation (1-3 air changes per hour) No. No. [Effectiveness - Inhalation: 0%]	
Amounts used, Frequency and de Duration of activity Technical conditions and measure General ventilation Containment Local exhaust ventilation Occupational Health and Safety Management System	<8 hour(s)	
Amounts used, Frequency and de Duration of activity Technical conditions and measure General ventilation Containment Local exhaust ventilation Occupational Health and Safety Management System Conditions and measures related	<8 hour(s)	
Amounts used, Frequency and de Duration of activity Technical conditions and measure General ventilation Containment Local exhaust ventilation Occupational Health and Safety Management System Conditions and measures related Hand protection/ Skin protection	<8 hour(s)	
Amounts used, Frequency and de Duration of activity Technical conditions and measure General ventilation Containment Local exhaust ventilation Occupational Health and Safety Management System Conditions and measures related Hand protection/ Skin protection Respiratory protection	<8 hour(s)	

Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )
Contributing scenario controlling PROC8b Transfer at dedicated facilit	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and du	ration of use
Duration of activity	<8 hour(s)
Technical conditions and measure	es 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	s affecting workers exposure
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )
<b>Contributing scenario controlling</b> PROC9 Filling small containers in de	• • • • • • • • • • • • • • • • • • • •
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and du	ration of use
Duration of activity	<8 hour(s)
Technical conditions and measure	es 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 condition	s 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 <sup>2</sup> )	
Contributing scenario controlling PROC8a Maintenance and cleaning	• • • •	
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and du	iration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measur	es 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 condition	s affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Elevated temperature < melting point	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Contributing scenario controlling PROC15 Use as laboratory reagent	• • • •	
Product (article) characteristic		
Dustiness of material	Low	100

Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and du	ration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measure	es to control dispersion from source tow	vards the worker
General ventilation	Basic general ventilation (1-3 air changes	s per hour)
Containment	No.	
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]	
Occupational Health and Safety Management System	Advanced	
Conditions and measures related t	o personal protection, hygiene and hea	Ith evaluation
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effect	iveness - Dermal: 80%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]	
Eye Protection	Safety spectacles/goggles/full face shield	1
Other given operational conditions	s 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 <sup>2</sup> )	
Section 3: Exposure estimation an	d reference to its source	
Contributing scenario controlling ERC2 Formulation of preparations	environmental exposure (1)	
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 <sup>-4</sup> mg/L	0.034
Sewage treatment plant	0.032 mg/L	0.011
Man via Environment - Inhalation	2.914 X 10 <sup>-11</sup> mg/m <sup>3</sup>	< 0.01
Man via Environment - Oral	1.049 X 10 <sup>-4</sup> mg/kg bw/day	< 0.01
Contributing scenario controlling PROC1 Use in closed process, no lik		
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 <sup>2</sup>	<0.01
Combined routes, Systemic effects, Long Term	-	<0.01
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling w PROC2 Use in closed, continuous pro Method: TRA Worker v3	orker exposure (2) cess with occasional controlled exposure	
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 <sup>2</sup>	0.04
Combined routes, Systemic effects, Long Term	-	0.139
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling w PROC4 Use in batch and other proces Method: TRA Worker v3	orker exposure (3) ss (synthesis) where opportunity for expos	sure arises

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 <sup>2</sup>	0.2
Combined routes, Systemic effects, Long Term	-	0.78
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling we PROC8b Receiving and charging of the 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,	0.1 mg/m <sup>3</sup>	
	0. Filighti	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m <sup>3</sup>	< 0.01
Long Term		
Long Term Inhalation, Local effects, Acute Dermal, Systemic effects, Long Term	0.4 mg/m <sup>3</sup>	< 0.01
Long Term Inhalation, Local effects, Acute Dermal, Systemic effects, Long Term Dermal, Local effects, Long Term Combined routes, Systemic	0.4 mg/m³ 1.371 mg/kg bw/day	< 0.01
Long Term Inhalation, Local effects, Acute Dermal, Systemic effects,	0.4 mg/m³ 1.371 mg/kg bw/day	< 0.01 0.686 0.1
Long Term         Inhalation, Local effects, Acute         Dermal, Systemic effects, Long Term         Dermal, Local effects, Long Term         Combined routes, Systemic effects, Long Term         Combined routes, Systemic         effects, Long Term         Combined routes, Systemic	0.4 mg/m <sup>3</sup> 1.371 mg/kg bw/day 0.1 mg/cm <sup>2</sup> - - - orker exposure (5)	< 0.01 0.686 0.1 0.704

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/m <sup>3</sup>	< 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 <sup>2</sup>	0.02
Combined routes, Systemic effects, Long Term	-	0.053
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling w PROC5 Mixing, dispersing and complete Method: TRA Worker v3	orker exposure (6) etion in open multistage batch process	
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,	0.5 mg/m <sup>3</sup>	
Long Term	<b>- - -</b>	0.016
Long Term Inhalation, Local effects, Acute	2 mg/m³	0.016
<b>°</b>	Ŭ	
Inhalation, Local effects, Acute Dermal, Systemic effects, Long Term	2 mg/m³	0.019
Inhalation, Local effects, Acute Dermal, Systemic effects, Long Term Dermal, Local effects, Long Term Combined routes, Systemic	2 mg/m³ 1.371 mg/kg bw/day	0.019 0.686
Inhalation, Local effects, Acute Dermal, Systemic effects,	2 mg/m³ 1.371 mg/kg bw/day	0.019 0.686 0.2
Inhalation, Local effects, Acute Dermal, Systemic effects, Long Term Dermal, Local effects, Long Term Combined routes, Systemic effects, Long Term Combined routes, Systemic	2 mg/m <sup>3</sup> 1.371 mg/kg bw/day 0.2 mg/cm <sup>2</sup> - - - vorker exposure (7)	0.019 0.686 0.2 0.779

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 <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling wo PROC8b Transfer at dedicated facilities		
Method: TRA Worker v3	-	<b></b>
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/m <sup>3</sup>	< 0.01
Inhalation, Local effects, Long Term	0.07 mg/m³	< 0.01
hale all at the second of the star in the second		
Innalation, Local effects, Acute	0.28 mg/m³	< 0.01
Dermal, Systemic effects,	0.28 mg/m³ 0.686 mg/kg bw/day	< 0.01
Dermal, Systemic effects, Long Term	-	
Dermal, Systemic effects, Long Term Dermal, Local effects, Long Term Combined routes, Systemic	0.686 mg/kg bw/day	0.343
Inhalation, Local effects, Acute         Dermal, Systemic effects, Long Term         Dermal, Local effects, Long Term         Combined routes, Systemic effects, Long Term         Combined routes, Systemic effects, Acute	0.686 mg/kg bw/day	0.343
Dermal, Systemic effects, Long Term Dermal, Local effects, Long Term Combined routes, Systemic effects, Long Term Combined routes, Systemic	0.686 mg/kg bw/day 0.05 mg/cm <sup>2</sup> - - rker exposure (9)	0.343 0.05 0.356

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/m <sup>3</sup>	< 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 <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.362
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling we PROC8a Maintenance and cleaning op 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,	0.5 mg/m <sup>3</sup>	
Long Term	0.0 mg/m	0.016
Long Term Inhalation, Local effects, Acute	2 mg/m <sup>3</sup>	0.016
Inhalation, Local effects, Acute Dermal, Systemic effects,	-	
	2 mg/m <sup>3</sup>	0.019
Inhalation, Local effects, Acute Dermal, Systemic effects, Long Term Dermal, Local effects, Long Term Combined routes, Systemic	2 mg/m³ 1.371 mg/kg bw/day	0.019 0.686
Inhalation, Local effects, Acute Dermal, Systemic effects, Long Term	2 mg/m³ 1.371 mg/kg bw/day	0.019 0.686 0.1
Inhalation, Local effects, Acute Dermal, Systemic effects, Long Term Dermal, Local effects, Long Term Combined routes, Systemic effects, Long Term Combined routes, Systemic	2 mg/m <sup>3</sup> 1.371 mg/kg bw/day 0.1 mg/cm <sup>2</sup> - -	0.019 0.686 0.1 0.779

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/m <sup>3</sup>	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m <sup>3</sup>	< 0.01
Dermal, Systemic effects, Long Term	0.068 mg/kg bw/day	0.034
Dermal, Local effects, Long Term	0.02 mg/cm <sup>2</sup>	0.02
Combined routes, Systemic effects, Long Term	-	0.053
Combined routes, Systemic effects, Acute	-	< 0.01
Section 4: Guidance to DU to evalu	ate whether he works inside the boun	daries set by the ES
No additional risk management meas workers.	sures, besides those that are mentioned a	above, are needed to guarantee safe use for

## 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	
<b>Contributing scenario controlling</b> ERC2 Formulation of preparations	environmental exposure (1)	

Amounts used, Frequency and de	iration 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 <sup>3</sup> m <sup>3</sup> /days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related	to external treatment of waste for disposal
	ste treatment operations: No (low risk) (ERC based assessment demonstrating control isk assumed for waste life stage. Waste disposal according to national/local legislation
Other given operational condition	s affecting environmental exposure
Receiving surface water flow	≥ 1.8 X 10 <sup>4</sup> m <sup>3</sup> /days
Contributing scenario controlling PROC1 Use in closed process, no I	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and du	iration of use
Duration of activity	<8 hour(s)
Technical conditions and measur	es 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 condition	s affecting workers exposure
Place of use	Indoor use

Skin surface potentially exposed       One hand face only (240 cm <sup>2</sup> )         Contributing scenario controlling worker exposure (2)         PROC2 Use in closed, continuous process with occasional controlled exposure         Product (article) characteristic         Dualiness of material       Low         Concentration of substance in inxture       Substance as such         Mnounts used, Frequency and duration of use         Duration of activity       <8 hour(s)         Feehnical conditions and measures to control dispersion from source towards the worker         Beneral ventilation       Basic general ventilation (1-3 air changes per hour)         Colcsed continuous process with occasional controlled exposure       Occal exhaust ventilation         No. [Effectiveness - Inhalation: 0%]       Colsed continuous process with occasional controlled exposure         Cocal exhaust ventilation       No. [Effectiveness - Inhalation: 0%]         Conditions and measures related to personal protection, hygiene and health evaluation         Conditions and measures related to personal protection, hygiene and health evaluation         Advanced       Mavanced         Protection       Safety spectacles/goggles/full face shield         Dther given operational conditions affecting workers exposure       Protection         Skin surface potentially exposed       Two hands face (480 cm <sup>2</sup> )         Protection of su	<b>_</b>	<b>_</b>
Contributing scenario controlling worker exposure (2)           PROC2 Use in closed, continuous process with occasional controlled exposure           Product (article) characteristic           Dustiness of material         Low           Substance in mixture         Substance as such           Amounts used, Frequency and duration of use         Duration of activity           Quartion of activity         <8 hour(s)	Process temperature (for solid)	
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         Mixture       Substance as such         Duration of activity       <8 hour(s)		
Dustiness of material         Low           Concentration of substance in mixture         Substance as such           Amounts used, Frequency and duration of use         Substance as such           Duration of activity         <8 hour(s)		
Concentration of substance in nixture         Substance as such           Amounts used, Frequency and duration of use            Duration of activity         <8 hour(s)	Product (article) characteristic	
Initiation         Initial and any series           Amounts used, Frequency and duration of use           Duration of activity         <8 hour(s)	Dustiness of material	Low
Duration of activity         <8 hour(s)	Concentration of substance in mixture	Substance as such
Fechnical conditions and measures to control dispersion from source towards the worker           Seneral ventilation         Basic general ventilation (1-3 air changes per hour)           Containment         Closed continuous process with occasional controlled exposure           Social exhaust ventilation         No. [Effectiveness - Inhalation: 0%]           Occupational Health and Safety Anangement System         Advanced           Conditions and measures related to personal protection, hygiene and health evaluation         No. [Effectiveness - Inhalation: 0%]           Conditions and measures related to personal protection, hygiene and health evaluation         No. [Effectiveness - Inhalation: 0%]           Conditions and measures related to personal protection, hygiene and health evaluation         No. [Effectiveness - Inhalation: 0%]           Conditions and measures related to personal protection, hygiene and health evaluation         No. [Effectiveness - Inhalation: 0%]           Respiratory protection         No. [Effectiveness - Inhalation: 0%]           Respiratory protection         No. [Effectiveness - Inhalation: 0%]           Protection         Safety spectacles/goggles/full face shield           Other given operational conditions affecting workers exposure         Place of use           Process temperature (for solid)         Elevated temperature < melting point	Amounts used, Frequency and du	ration of use
General ventilation         Basic general ventilation (1-3 air changes per hour)           Containment         Closed continuous process with occasional controlled exposure           cocal exhaust ventilation         No. [Effectiveness - Inhalation: 0%]           Occupational Health and Safety Management System         Advanced           Conditions and measures related to personal protection, hygiene and health evaluation         Model (Environment)           Conditions and measures related to personal protection, hygiene and health evaluation         Model (Environment)           Conditions and measures related to personal protection, hygiene and health evaluation         Model (Environment)           Conditions and measures related to personal protection, hygiene and health evaluation         Model (Environment)           Conditions and measures related to personal protection safety spectacles/goggles/full face shield         Model (Environment)           Cip Protection         Safety spectacles/goggles/full face shield           Cher given operational conditions         affecting workers exposure           Place of use         Indoor use           Process temperature (for solid)         Elevated temperature < melting point	Duration of activity	<8 hour(s)
Containment         Closed continuous process with occasional controlled exposure           cocal exhaust ventilation         No. [Effectiveness - Inhalation: 0%]           Advanced         Advanced           Conditions and measures related to personal protection, hygiene and health evaluation         Advanced           Conditions and measures related to personal protection, hygiene and health evaluation         Advanced           Conditions and measures related to personal protection, hygiene and health evaluation         Advanced           Conditions and measures related to personal protection, hygiene and health evaluation         Advanced           Conditions and measures related to personal protection, hygiene and health evaluation         Advanced           Conditions and measures related to personal protection, hygiene and health evaluation         Management System           Conditions and measures related to personal protection, hygiene and health evaluation         Management System           Conditions and measures related to personal protection (Sin protection)         No. [Effectiveness - Inhalation: 0%]           Cype Protection         Safety spectacles/goggles/full face shield           Dther given operational conditions affecting workers exposure         Place of use           Process temperature (for solid)         Elevated temperature < melting point	Technical conditions and measure	es to control dispersion from source towards the worker
ocal exhaust ventilationNo. [Effectiveness - Inhalation: 0%]Occupational Health and Safety Management SystemAdvancedConditions and measures related to personal protection, hygiene and health evaluationHand protection/ Skin protectionWear impervious gloves (EN374). [Effectiveness - Dermal: 80%]Respiratory protectionNo. [Effectiveness - Inhalation: 0%]SystemSafety spectacles/goggles/full face shieldOther given operational conditionsaffecting workers exposurePlace of useIndoor useProcess temperature (for solid)Elevated temperature < melting point	General ventilation	Basic general ventilation (1-3 air changes per hour)
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	Containment	Closed continuous process with occasional controlled exposure
Management System       Conditions and measures related to personal protection, hygiene and health evaluation         Conditions and measures related to personal protection, hygiene and health evaluation       Management System         Conditions and measures related to personal protection, hygiene and health evaluation       Management System         Respiratory protection       No. [Effectiveness - Inhalation: 0%]         Eye Protection       Safety spectacles/goggles/full face shield         Other given operational conditions affecting workers exposure       Place of use         Place of use       Indoor use         Process temperature (for solid)       Elevated temperature < melting point	Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
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         Dther given operational conditions       affecting workers exposure         Place of use       Indoor use         Process temperature (for solid)       Elevated temperature < melting point	Occupational Health and Safety Management System	Advanced
Respiratory protection       No. [Effectiveness - Inhalation: 0%]         Eye Protection       Safety spectacles/goggles/full face shield         Dther given operational conditions       affecting workers exposure         Place of use       Indoor use         Process temperature (for solid)       Elevated temperature < melting point	Conditions and measures related	to personal protection, hygiene and health evaluation
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	Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 80%]
Defer given operational conditions affecting workers exposure         Place of use       Indoor use         Process temperature (for solid)       Elevated temperature < melting point	Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Place of use       Indoor use         Process temperature (for solid)       Elevated temperature < melting point	Eye Protection	Safety spectacles/goggles/full face shield
Process temperature (for solid)       Elevated temperature < melting point	Other given operational condition	s affecting workers exposure
Skin surface potentially exposed       Two hands face (480 cm²)         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 nixture       Substance as such         Amounts used, Frequency and duration of use         Duration of activity       <8 hour(s)	Place of use	Indoor use
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 nixture       Substance as such         Amounts used, Frequency and duration of use         Duration of activity       <8 hour(s)	Process temperature (for solid)	Elevated temperature < melting point
PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises         Product (article) characteristic         Dustiness of material       Low         Concentration of substance in nixture       Substance as such         Amounts used, Frequency and duration of use         Duration of activity       <8 hour(s)	Skin surface potentially exposed	Two hands face (480 cm <sup>2</sup> )
Dustiness of material       Low         Concentration of substance in nixture       Substance as such         Amounts used, Frequency and duration of use       Substance as such         Duration of activity       <8 hour(s)		
Concentration of substance in nixture       Substance as such         Amounts used, Frequency and duration of use       Concentration of activity         Ouration of activity       <8 hour(s)	Product (article) characteristic	
Inixture       Amounts used, Frequency and duration of use         Duration of activity       <8 hour(s)	Dustiness of material	Low
Duration of activity     <8 hour(s)	Concentration of substance in mixture	Substance as such
Fechnical 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	Amounts used, Frequency and du	ration of use
General ventilation       Basic general ventilation (1-3 air changes per hour)         Containment       Semi-closed process with occasional controlled exposure	Duration of activity	<8 hour(s)
Containment Semi-closed process with occasional controlled exposure	Technical conditions and measure	es to control dispersion from source towards the worker
	General ventilation	Basic general ventilation (1-3 air changes per hour)
ocal exhaust ventilation No. [Effectiveness - Inhalation: 0%]	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 condition	s 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 <sup>2</sup> )	
Contributing scenario controlling PROC8b Receiving and charging of	,	
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and du	iration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measur	es 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 condition	s affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Elevated temperature < melting point	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Contributing scenario controlling PROC3 Mixing, dispersing, complet	• • • • • •	
Product (article) characteristic		
Dustiness of material	Low	110

Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and du	ration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measure	es 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 condition	s 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 <sup>2</sup> )	
Contributing scenario controlling PROC5 Mixing, dispersing and comp	worker exposure (6) bletion in open multistage batch process	
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and du	ration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measure	es 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	s 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 <sup>2</sup> )
Contributing scenario controlling PROC8a Transfer in non-dedicated f	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and du	ration of use
Duration of activity	<8 hour(s)
Technical conditions and measure	s 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 t	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	s affecting workers exposure
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )
Contributing scenario controlling PROC8b Transfer at dedicated facilit	• • • • • •
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and du	ration of use
Duration of activity	<8 hour(s)
Technical conditions and measure	to control dispersion from source towards the worker

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 condition	s affecting workers exposure
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )
<b>Contributing scenario controlling</b> PROC9 Filling small containers in d	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and de	uration of use
Duration of activity	<8 hour(s)
Technical conditions and measur	es 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 condition	s 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 <sup>2</sup> )

Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and d	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measu	es 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 condition	ns affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Elevated temperature < melting point	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Contributing scenario controlling PROC15 Use as laboratory reagen	· · · · ·	
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and d	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measu	es 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	11

Conditions and measures related	to personal protection, hygiene and hea	Ith 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 shiel	d
Other given operational condition	s 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 <sup>2</sup> )	
Section 3: Exposure estimation ar	nd reference to its source	
Contributing scenario controlling ERC2 Formulation of preparations	environmental exposure (1)	
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 <sup>-4</sup> mg/L	0.028
Sewage treatment plant	0.025 mg/L	< 0.01
Man via Environment - Inhalation	2.913 X 10 <sup>-11</sup> mg/m <sup>3</sup>	< 0.01
Man via Environment - Oral	8.144 X 10 <sup>-5</sup> mg/kg bw/day	< 0.01
Contributing scenario controlling PROC1 Use in closed process, no li		
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/m <sup>3</sup>	<0.01
Inhalation, Local effects, Long Term	0.01 mg/m³	<0.01
Inhalation, Local effects, Acute	0.04 mg/m <sup>3</sup>	<0.01
Dermal, Systemic effects, Long Term	0.007 mg/kg bw/day	<0.01
Dermal, Local effects, Long Term	0.002 mg/cm <sup>2</sup>	<0.01
Combined routes, Systemic effects, Long Term	-	<0.01

Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling wo PROC2 Use in closed, continuous proce		9
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/m <sup>3</sup>	<0.01
Inhalation, Local effects, Long Term	0.01 mg/m³	<0.01
Inhalation, Local effects, Acute	0.04 mg/m <sup>3</sup>	<0.01
Dermal, Systemic effects, Long Term	0.274 mg/kg bw/day	0.137
Dermal, Local effects, Long Term	0.04 mg/cm <sup>2</sup>	0.04
Combined routes, Systemic effects, Long Term	-	0.139
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling wo PROC4 Use in batch and other process		sure 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/m <sup>3</sup>	0.019
Dermal, Systemic effects, Long Term	1.372 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.2 mg/cm <sup>2</sup>	0.2
Combined routes, Systemic effects, Long Term	-	0.78
Combined routes, Systemic	-	0.019

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/m <sup>3</sup>	< 0.01
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.704
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling w	orker exposure (5)	
PROC3 Mixing, dispersing, completion	n in closed batch process	
	n in closed batch process	
PROC3 Mixing, dispersing, completion Method: TRA Worker v3 Route of exposure and type of effects	n in closed batch process Exposure concentration	Risk characterisation ratio
Method: TRA Worker v3 Route of exposure and type of		Risk characterisation ratio
Method: TRA Worker v3 Route of exposure and type of effects Inhalation, Systemic effects,	Exposure concentration	Risk characterisation ratio
Method: TRA Worker v3 Route of exposure and type of effects Inhalation, Systemic effects, Long Term	Exposure concentration 0.1 mg/m <sup>3</sup>	0.019
Method: TRA Worker v3 Route of exposure and type of effects Inhalation, Systemic effects, Long Term Inhalation, Systemic effects, Acute Inhalation, Local effects,	Exposure concentration 0.1 mg/m <sup>3</sup> 0.4 mg/m <sup>3</sup>	0.019
Method: TRA Worker v3 Route of exposure and type of effects Inhalation, Systemic effects, Long Term Inhalation, Systemic effects, Acute Inhalation, Local effects, Long Term	Exposure concentration 0.1 mg/m³ 0.4 mg/m³ 0.1 mg/m³	0.019 < 0.01 < 0.01
Method: TRA Worker v3 Route of exposure and type of effects Inhalation, Systemic effects, Long Term Inhalation, Local effects, Long Term Inhalation, Local effects, Acute Dermal, Systemic effects,	Exposure concentration 0.1 mg/m <sup>3</sup> 0.4 mg/m <sup>3</sup> 0.1 mg/m <sup>3</sup> 0.4 mg/m <sup>3</sup>	0.019 < 0.01 < 0.01 < 0.01
Method: TRA Worker v3 Route of exposure and type of effects Inhalation, Systemic effects, Long Term Inhalation, Local effects, Acute Inhalation, Local effects, Acute Dermal, Systemic effects, Long Term	Exposure concentration         0.1 mg/m³         0.4 mg/m³         0.1 mg/m³         0.4 mg/m³         0.4 mg/m³         0.4 mg/m³         0.4 mg/m³         0.4 mg/m³         0.4 mg/m³	0.019 < 0.01 < 0.01 < 0.01 0.034

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 <sup>2</sup>	0.2
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling we PROC8a Transfer in non-dedicated fac	,	
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/m <sup>3</sup>	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 <sup>2</sup>	0.1
Combined routes, Systemic	-	0.779
effects, Long Term		

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/m <sup>3</sup>	< 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 <sup>2</sup>	0.05
Combined routes, Systemic effects, Long Term	-	0.356
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling w PROC9 Filling small containers in ded		
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
	0.1 mg/m³	< 0.01
Inhalation, Local effects, Long Term		
	0.4 mg/m³	< 0.01
Long Term	0.4 mg/m³ 0.686 mg/kg bw/day	< 0.01 0.343
Long Term Inhalation, Local effects, Acute Dermal, Systemic effects,	ő	
Long Term Inhalation, Local effects, Acute Dermal, Systemic effects, Long Term	0.686 mg/kg bw/day	0.343

effects         0.5 mg/m³         0.094           nhalation, Systemic effects, .ong Term         0.5 mg/m³         0.019           nhalation, Local effects, .ong Term         0.5 mg/m³         0.019           nhalation, Local effects, .ong Term         0.5 mg/m³         0.019           nhalation, Local effects, Acute         2 mg/m³         0.019           Dermal, Systemic effects, .ong 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         -         0.779           Contributing scenario controlling worker exposure (11) PROC15 Use as laboratory reagent         -         0.019           Contributing scenario controlling worker exposure (11) PROC15 Use as laboratory reagent         -         0.019           Route of exposure and type of affects         Exposure concentration effects         Risk characterisation ratio effects           ong Term         0.1 mg/m³         0.019         -           nhalation, Systemic effects, .ong Term         0.1 mg/m³         < 0.01           nhalation, Local effects, Acute         0.4 mg/m³         < 0.01           nhalation, Local effects, Long Term         0.068 mg/kg bw/day         0.034           .ong Term         0.068 mg/kg bw/day         0.034	Method: TRA Worker v3		
Long Term       Inhalation, Systemic effects, Acute       2 mg/m³       0.019         Inhalation, Local effects, Long Term       0.5 mg/m³       0.019         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/cm²       0.1         Combined routes, Systemic effects, Long Term       0.1 mg/cm²       0.1         Combined routes, Systemic effects, Acute       -       0.019         Combined routes, Systemic effects, Acute       -       0.019         Contributing scenario controlling worker exposure (11) PROC15 Use as laboratory reagent       -       0.019         Route of exposure and type of effects       Exposure concentration effects       Risk characterisation ratio effects         Inhalation, Systemic effects, Long Term       0.1 mg/m³       0.019         Inhalation, Systemic effects, Long Term       0.4 mg/m³       < 0.01         Inhalation, Local effects, Acute       0.4 mg/m³       < 0.01         Inhalation, Local effects, Acute       0.4 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, L	Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
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/cm²         0.1           Combined routes, Systemic effects, Long Term         0.1 mg/cm²         0.1           Combined routes, Systemic effects, Acute         -         0.779           Combined routes, Systemic effects, Acute         -         0.019           Contributing scenario controlling worker exposure (11) PROC15 Use as laboratory reagent         Contributing scenario controlling worker exposure (11) PROC15 Use as laboratory reagent         Risk characterisation ratio           Method: TRA Worker v3         0.01 mg/m³         0.019           Inhalation, Systemic effects, Long Term         0.1 mg/m³         0.019           Inhalation, Systemic effects, Acute         0.4 mg/m³         < 0.01		0.5 mg/m³	0.094
Long TermInhalation, Local effects, Acute2 mg/m³0.019Dermal, Systemic effects, Long Term1.371 mg/kg bw/day0.686Dermal, Local effects, Long Term0.1 mg/cm²0.1Combined routes, Systemic effects, Long Term-0.779Combined routes, Systemic effects, Acute-0.019Combined routes, Systemic effects, Acute-0.019Contributing scenario controlling worker exposure (11) PROC15 Use as laboratory reagent-0.019Route of exposure and type of effectsExposure concentration effectsRisk characterisation ratio effectsInhalation, Systemic effects, Long Term0.1 mg/m³0.019Inhalation, Systemic effects, Long Term0.1 mg/m³<	Inhalation, Systemic effects, Acute	2 mg/m <sup>3</sup>	0.019
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       -       0.779         Combined routes, Systemic effects, Acute       -       0.019         Contributing scenario controlling worker exposure (11) PROC15 Use as laboratory reagent       0.019         Method: TRA Worker v3       Exposure concentration effects,       Risk characterisation ratio effects         Nute of exposure and type of effects       0.1 mg/m³       0.019         Inhalation, Systemic effects, Long Term       0.1 mg/m³       0.010         Inhalation, Systemic effects, Long Term       0.1 mg/m³       <0.01		0.5 mg/m³	0.016
Long Term       0.1 mg/cm²       0.1         Dermal, Local effects, Long Term       0.1 mg/cm²       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       -       0.019         Method: TRA Worker v3       Exposure concentration effects       Risk characterisation ratio effects         Inhalation, Systemic effects, Long Term       0.1 mg/m³       0.019         Inhalation, Systemic effects, Acute       0.4 mg/m³       < 0.01	Inhalation, Local effects, Acute	2 mg/m³	0.019
Combined routes, Systemic       -       0.779         effects, Long Term       0.019         Combined routes, Systemic       -       0.019         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, Acute       Exposure concentration effects         Inhalation, Systemic effects, Long Term       0.1 mg/m³       0.019         Inhalation, Local effects, Acute       0.4 mg/m³       <0.01		1.371 mg/kg bw/day	0.686
effects, Long Term       0.019         Combined routes, Systemic effects, Acute       0.019         Contributing scenario controlling worker exposure (11) PROC15 Use as laboratory reagent       PROC15 Use as laboratory reagent         Method: TRA Worker v3       Exposure concentration effects       Risk characterisation ratio         Route of exposure and type of effects       Exposure concentration effects       Risk characterisation ratio         Inhalation, Systemic effects, Long Term       0.1 mg/m³       0.019         Inhalation, Local effects, Acute       0.4 mg/m³       <0.01	Dermal, Local effects, Long Term	0.1 mg/cm <sup>2</sup>	0.1
effects, Acute       Contributing scenario controlling worker exposure (11)         PROC15 Use as laboratory reagent       Method: TRA Worker v3         Route of exposure and type of effects       Exposure concentration of effects         Inhalation, Systemic effects, Long Term       0.1 mg/m³       0.019         Inhalation, Local effects, Acute       0.4 mg/m³       < 0.01		-	0.779
PROC15 Use as laboratory reagent         Method: TRA Worker v3       Exposure concentration       Risk characterisation ratio         Route of exposure and type of effects       Exposure concentration       Risk characterisation ratio         Inhalation, Systemic effects, Long Term       0.1 mg/m³       0.019         Inhalation, Local effects, Acute       0.4 mg/m³       < 0.01		-	0.019
Route of exposure and type of effectsExposure concentrationRisk characterisation ratioInhalation, Systemic effects, Long Term0.1 mg/m³0.019Inhalation, Systemic effects, Acute0.4 mg/m³< 0.01Inhalation, Local effects, Long Term0.1 mg/m³< 0.01Inhalation, Local effects, Acute0.4 mg/m³< 0.01Inhalation, Local effects, Acute0.4 mg/m³< 0.01Dermal, Systemic effects, Acute0.4 mg/m³< 0.01Dermal, Systemic effects, Long Term0.028 mg/kg bw/day0.034Dermal, Local effects, Long Term0.02 mg/cm²0.02Combined routes, Systemic effects, Long Term-0.053	PROC15 Use as laboratory reagent	rker exposure (11)	
effectsInhalation, Systemic effects, Long Term0.1 mg/m³0.019Inhalation, Systemic effects, Acute0.4 mg/m³< 0.01	Method: TRA Worker v3		
Long Term		Exposure concentration	Risk characterisation ratio
Inhalation, Local effects, Long Term0.1 mg/m³< 0.01Inhalation, Local effects, Acute0.4 mg/m³< 0.01	-	0.1 mg/m³	0.019
Long TermOutputInhalation, Local effects, Acute0.4 mg/m³< 0.01	Inhalation, Systemic effects, Acute	0.4 mg/m <sup>3</sup>	< 0.01
Dermal, Systemic effects, Long Term     0.068 mg/kg bw/day     0.034       Dermal, Local effects, Long Term     0.02 mg/cm <sup>2</sup> 0.02       Combined routes, Systemic effects, Long Term     -     0.053       Combined routes, Systemic     -     < 0.01		0.1 mg/m³	< 0.01
Long Term     0.02 mg/cm <sup>2</sup> 0.02       Dermal, Local effects, Long Term     0.02 mg/cm <sup>2</sup> 0.02       Combined routes, Systemic     -     0.053       effects, Long Term     -     <0.01	Inhalation, Local effects, Acute	0.4 mg/m³	< 0.01
Combined routes, Systemic - 0.053 effects, Long Term Combined routes, Systemic - < 0.01		0.068 mg/kg bw/day	0.034
effects, Long Term Combined routes, Systemic - < 0.01	Dermal, Local effects, Long Term	0.02 mg/cm <sup>2</sup>	0.02
	-	-	0.053
	effects, Long Term		< 0.01

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

Section 1: Title of exposure scena	rio
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 e	environmental exposure (1)
Amounts used, Frequency and du	ration of use
Daily wide dispersive use	≤ 8.25 X 10 <sup>-5</sup> tonnes/day
Percentage of tonnage used at regional scale	10%
Conditions and measures related t	o municipal sewage treatment plant
Municipal STP	Yes. [Effectiveness - Water: 87.34%]
Discharge rate of STP	≥ 2 X 10 <sup>3</sup> m³/days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related t	o external treatment of waste for disposal
	e treatment operations: No (low risk) (ERC based assessment demonstrating control sk assumed for waste life stage. Waste disposal according to national/local legislation
Other given operational conditions	affecting environmental exposure
Receiving surface water flow	≥ 1.8 X 10 <sup>4</sup> m <sup>3</sup> /days
<b>Contributing scenario controlling</b> PC39 Cosmetics, personal care prod	
Product (article) characteristic	
Product/ Article subcategory	No value
Contributing scenario controlling of PC29 Pharmaceuticals	consumer exposure (2)
Product (article) characteristic	
Product/ Article subcategory	No value
Section 3: Exposure estimation an	d reference to its source
Contributing scenario controlling e ERC8e Consumer use	environmental exposure (1)

Release route	Release rate	Release estimation method
Water	0.002 kg/day	ERC based
Air	8.25 X 10 <sup>-5</sup> kg/day	ERC based
Soil	8.25 X 10 <sup>-4</sup> kg/day	ERC based
Protection target	Exposure estimation	Risk characterisation ratio
Fresh water	2.744 X 10 <sup>-4</sup> mg/L	<0.01
Sea water	2.625 X 10 <sup>-5</sup> mg/L	<0.01
Sewage treatment plant	1.044 X 10 <sup>-4</sup> mg/L	<0.01
Man via Environment - Inhalation	2.912 X 10 <sup>-11</sup> mg/m <sup>3</sup>	<0.01
Man via Environment - Oral	7.289 X 10 <sup>-5</sup> mg/kg bw/day	<0.01
<b>Contributing scenario controlling c</b> PC39 Cosmetics, personal care produ	• • • • •	
Not available		
Contributing scenario controlling control PC29 Pharmaceuticals	onsumer exposure (2)	
Not available		
Section 4: Guidance to DU to evaluate	ate whether he works inside the bound	laries set by the ES
	ures besides these that are mentioned a	the second s

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

Section 2: Operational conditions	of use
<b>Contributing scenario controlling</b> ERC2 Formulation of preparations	environmental exposure (1)
Amounts used, Frequency and du	ration 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 <sup>3</sup> m <sup>3</sup> /days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related	to external treatment of waste for disposal
	te treatment operations: No (low risk) (ERC based assessment demonstrating control sk assumed for waste life stage. Waste disposal according to national/local legislation
Other given operational condition	s affecting environmental exposure
Receiving surface water flow	≥ 1.8 X 10 <sup>4</sup> m³/days
Contributing scenario controlling PROC1 Use in closed process, no lil	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and du	ration of use
Duration of activity	<8 hour(s)
Technical conditions and measure	es 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 condition	is 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 <sup>2</sup> )
Contributing scenario controlling PROC2 Use in closed, continuous p	worker exposure (2) rocess with occasional controlled exposure
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and du	iration of use
Duration of activity	<8 hour(s)
Technical conditions and measur	es 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 condition	s 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 <sup>2</sup> )
Contributing scenario controlling PROC4 Use in batch and other proc	worker exposure (3) cess (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 du	iration of use
Duration of activity	<8 hour(s)
Technical conditions and measur	es 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 124
	-

Dustiness of material	Low	125/2
Product (article) characteristic		
Contributing scenario controlling PROC3 Mixing, dispersing, completing	• • • • •	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Process temperature (for solid)	Elevated temperature < melting point	
Place of use	Indoor use	
Other given operational condition	s affecting workers exposure	
Eye Protection	Safety spectacles/goggles/full face shield	
Respiratory protection	No. [Effectiveness - Inhalation: 0%]	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]	
Conditions and measures related	to personal protection, hygiene and health evaluation	
Occupational Health and Safety Management System	Advanced	
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]	
Containment	Semi-closed process with occasional controlled exposure	
General ventilation	Basic general ventilation (1-3 air changes per hour)	
Technical conditions and measur	es to control dispersion from source towards the worker	
Duration of activity	<8 hour(s)	
Amounts used, Frequency and du	ration of use	
Concentration of substance in mixture	Substance as such	
Dustiness of material	Low	
Product (article) characteristic		
Contributing scenario controlling PROC8b Receiving and charging of	• • • • • •	
Skin surface potentially exposed	Two hands face (480 cm <sup>2</sup> )	
Process temperature (for solid)	Elevated temperature < melting point	
Place of use	Indoor use	
Other given operational condition	s affecting workers exposure	
Eye Protection	Safety spectacles/goggles/full face shield	
Respiratory protection	No. [Effectiveness - Inhalation: 0%]	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 80%]	
Conditions and measures related	to personal protection, hygiene and health evaluation	
Occupational Health and Safety Management System	Advanced	

Concentration of substance in mixture	Substance as such
Amounts used, Frequency and du	ration of use
Duration of activity	<8 hour(s)
Technical conditions and measure	s 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 t	o 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	s 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 <sup>2</sup> )
Contributing scenario controlling PROC5 Mixing, dispersing and comp	worker exposure (6) etion in open multistage batch process
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and du	ration of use
Duration of activity	<8 hour(s)
Technical conditions and measure	s 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	o 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	s 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 <sup>2</sup> )
Contributing scenario controlling PROC8a Transfer in non-dedicated f	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and du	ration of use
Duration of activity	<8 hour(s)
Technical conditions and measure	es 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	s affecting workers exposure
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )
Contributing scenario controlling PROC8b Transfer at dedicated facilit	• • • • • • • • • • • • • • • • • • • •
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and du	ration of use
Duration of activity	<8 hour(s)
	l
Technical conditions and measure	es to control dispersion from source towards the worker

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 t	o 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	s affecting workers exposure
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )
<b>Contributing scenario controlling v</b> PROC9 Filling small containers in de	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and du	ration of use
Duration of activity	<8 hour(s)
Technical conditions and measure	s 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 t	o 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 <sup>2</sup> )
Contributing scenario controlling PROC8a Maintenance and cleaning	

Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and de	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measur	es 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 condition	ns affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Elevated temperature < melting point	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Contributing scenario controlling PROC15 Use as laboratory reagent		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and de	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measur	es 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%]	129

Respiratory protection	No. [Effectiveness - Inhalation: 0%]	
Eye Protection	Safety spectacles/goggles/full face shield	1
Other given operational conditions	s 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 <sup>2</sup> )	
Section 3: Exposure estimation an	d reference to its source	
Contributing scenario controlling ERC2 Formulation of preparations	environmental exposure (1)	
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 PROC1 Use in closed process, no like	• • • • •	
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 <sup>3</sup>	<0.01
Inhalation, Systemic effects, Acute	0.04 mg/m <sup>3</sup>	<0.01
Inhalation, Local effects, Long Term	0.01 mg/m³	<0.01
Inhalation, Local effects, Acute	0.04 mg/m <sup>3</sup>	<0.01
Dermal, Systemic effects, Long Term	0.007 mg/kg bw/day	<0.01
Dermal, Local effects, Long Term	0.002 mg/cm <sup>2</sup>	<0.01
Combined routes, Systemic effects, Long Term	-	<0.01
Combined routes, Systemic effects, Acute	-	<0.01

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/m <sup>3</sup>	<0.01
Inhalation, Local effects, Long Term	0.01 mg/m³	<0.01
Inhalation, Local effects, Acute	0.04 mg/m <sup>3</sup>	<0.01
Dermal, Systemic effects, Long Term	0.274 mg/kg bw/day	0.137
Dermal, Local effects, Long Term	0.04 mg/cm <sup>2</sup>	0.04
Combined routes, Systemic effects, Long Term	-	0.139
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling wo	orker exposure (3) s (synthesis) where opportunity for expo	sure arises
	<b>() ) 11 ) 1</b>	
•		
Method: TRA Worker v3 Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Method: TRA Worker v3 Route of exposure and type of		Γ
Method: TRA Worker v3 Route of exposure and type of effects Inhalation, Systemic effects, Long Term	Exposure concentration	Risk characterisation ratio
Method: TRA Worker v3 Route of exposure and type of effects Inhalation, Systemic effects,	Exposure concentration 0.5 mg/m <sup>3</sup>	Risk characterisation ratio
Method: TRA Worker v3 Route of exposure and type of effects Inhalation, Systemic effects, Long Term Inhalation, Systemic effects, Acute Inhalation, Local effects,	Exposure concentration 0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup>	Risk characterisation ratio
Method: TRA Worker v3         Route of exposure and type of effects         Inhalation, Systemic effects, Long Term         Inhalation, Systemic effects, Acute         Inhalation, Local effects, Long Term	Exposure concentration 0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup> 0.5 mg/m <sup>3</sup>	Risk characterisation ratio 0.094 0.019 0.016
Method: TRA Worker v3         Route of exposure and type of effects         Inhalation, Systemic effects, Long Term         Inhalation, Systemic effects, Acute         Inhalation, Local effects, Acute         Inhalation, Local effects, Acute         Dermal, Systemic effects, Long Term	Exposure concentration 0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup> 0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup>	Risk characterisation ratio           0.094           0.019           0.016           0.019
Method: TRA Worker v3         Route of exposure and type of effects         Inhalation, Systemic effects, Long Term         Inhalation, Systemic effects, Acute         Inhalation, Local effects, Acute         Inhalation, Local effects, Acute         Inhalation, Systemic effects, Acute         Inhalation, Local effects, Acute         Dermal, Systemic effects,	Exposure concentration 0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup> 0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup> 1.372 mg/kg bw/day	Risk characterisation ratio           0.094           0.019           0.016           0.019           0.019
Method: TRA Worker v3         Route of exposure and type of effects         Inhalation, Systemic effects, Long Term         Inhalation, Systemic effects, Acute         Inhalation, Local effects, Acute         Inhalation, Local effects, Acute         Dermal, Systemic effects, Long Term         Dermal, Local effects, Long Term         Combined routes, Systemic	Exposure concentration 0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup> 0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup> 1.372 mg/kg bw/day	Risk characterisation ratio           0.094           0.019           0.016           0.019           0.686           0.2
Method: TRA Worker v3         Route of exposure and type of effects         Inhalation, Systemic effects, Long Term         Inhalation, Systemic effects, Acute         Inhalation, Local effects, Acute         Inhalation, Local effects, Acute         Inhalation, Local effects, Acute         Dermal, Systemic effects, Long Term         Dermal, Local effects, Long Term         Combined routes, Systemic effects, Long Term         Combined routes, Systemic	Exposure concentration 0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup> 0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup> 1.372 mg/kg bw/day 0.2 mg/cm <sup>2</sup> - - orker exposure (4)	Risk characterisation ratio           0.094           0.019           0.016           0.019           0.686           0.2           0.78
Method: TRA Worker v3         Route of exposure and type of effects         Inhalation, Systemic effects, Long Term         Inhalation, Systemic effects, Acute         Inhalation, Local effects, Acute         Inhalation, Local effects, Acute         Dermal, Systemic effects, Long Term         Dermal, Local effects, Long Term         Combined routes, Systemic effects, Long Term         Combined routes, Systemic effects, Acute         Combined routes, Systemic effects, Acute         Combined routes, Systemic effects, Acute         Combined routes, Systemic effects, Acute	Exposure concentration 0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup> 0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup> 1.372 mg/kg bw/day 0.2 mg/cm <sup>2</sup> - - orker exposure (4)	Risk characterisation ratio           0.094           0.019           0.016           0.019           0.686           0.2           0.78

Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m <sup>3</sup>	< 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 <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.704
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling w PROC3 Mixing, dispersing, completion		
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 <sup>2</sup>	0.02
Combined routes, Systemic effects, Long Term	-	0.053
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling w PROC5 Mixing, dispersing and complete		
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,	0.5 mg/m³	0.016
Long Term		132

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 <sup>2</sup>	0.2
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling wo PROC8a Transfer in non-dedicated faci		
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/m <sup>3</sup>	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling wo 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/m <sup>3</sup>	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m <sup>3</sup>	< 0.01
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm <sup>2</sup>	0.1
		0 704 133

effects, Long Term		
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling wo PROC9 Filling small containers in dedic	• • • •	
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/m <sup>3</sup>	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m <sup>3</sup>	< 0.01
Dermal, Systemic effects, Long Term	0.686 mg/kg bw/day	0.343
Dermal, Local effects, Long Term	0.1 mg/cm <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.362
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling wo PROC8a Maintenance and cleaning ope		
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/m <sup>3</sup>	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019

Contributing scenario controlling wo PROC15 Use as laboratory reagent	orker exposure (11)	
Method: TRA Worker v3		
Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Inhalation, Systemic effects, Long Term	0.1 mg/m <sup>3</sup>	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m <sup>3</sup>	< 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 <sup>2</sup>	0.02
Combined routes, Systemic effects, Long Term	-	0.053
Combined routes, Systemic effects, Acute	-	< 0.01
Section 4: Guidance to DU to evaluat	te whether he works inside the bound	daries set by the ES
No additional risk management measur workers.	res, besides those that are mentioned a	bove, are needed to guarantee safe use for

## 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

<u></u>	
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 ERC6b Use at industrial site	environmental exposure (1)
Amounts used, Frequency and du	Iration 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 <sup>3</sup> m <sup>3</sup> /days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related	to external treatment of waste for disposal
	ste treatment operations: No (low risk) (ERC based assessment demonstrating control isk assumed for waste life stage. Waste disposal according to national/local legislation
Other given operational condition	is affecting environmental exposure
Receiving surface water flow	≥ 1.8 X 10 <sup>4</sup> m <sup>3</sup> /days
Contributing scenario controlling PROC2 Application of dyestuffs in c	worker exposure (1) losed system with occasional controlled exposure
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
mixture	
Solid in solid mixtures	Yes
Solid in solid mixtures	
Solid in solid mixtures Amounts used, Frequency and du Duration of activity	uration of use
Solid in solid mixtures Amounts used, Frequency and du Duration of activity	vration of use <pre></pre> <pr< td=""></pr<>
Solid in solid mixtures Amounts used, Frequency and du Duration of activity Technical conditions and measur	Image: state of the state
Solid in solid mixtures Amounts used, Frequency and du Duration of activity Technical conditions and measur General ventilation	uration of use         <8 hour(s)

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 condition	ns affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands face (480 cm <sup>2</sup> )	
Contributing scenario controlling PROC8b Raw material receipt and		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	>25%	
Solid in solid mixtures	Yes	
Amounts used, Frequency and d	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measured	res 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 condition	ns affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Contributing scenario controlling PROC5 Preparation of dyestuffs ap		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in	>25%	137

mixture		
Solid in solid mixtures	Yes	
Amounts used, Frequency and du	iration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measur	es 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 condition	s affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands face (480 cm <sup>2</sup> )	
Contributing scenario controlling PROC8a Batch loading of equipment		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	>25%	
Solid in solid mixtures	Yes	
Amounts used, Frequency and du	iration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measur	es 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	
	to personal protection, hygiene and health evaluation	
	to personal protection, hygiene and health evaluation Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]	

Eye Protection	Safety spectacles/goggles/full face shield
Other given operational condition	s affecting workers exposure
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )
Contributing scenario controlling PROC7 Spray coating- any techniqu	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and du	iration of use
Duration of activity	<8 hour(s)
Technical conditions and measure	es 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 condition	s affecting workers exposure
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands and upper wrists (1500 cm <sup>2</sup> )
Contributing scenario controlling PROC10 Brushing, roller, spreader,	worker exposure (6) flow coating or printing- any technique
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes 13

Duration of activity	<8 hour(s)	
Technical conditions and measu	res 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	t opersonal 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 conditio	ns affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Contributing scenario controlling PROC13 Treatment of articles by d		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	>25%	
Solid in solid mixtures	Yes	
Amounts used, Frequency and d	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measu	res 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	Advanced	
Management System	t o personal protection, hygiene and health evaluation	
	to personal protection, nygiene and nearth evaluation	
	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]	
Conditions and measures related		
Conditions and measures related Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]	

Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm <sup>2</sup> )
Contributing scenario controlling PROC2 Curing and drying processe	worker exposure (8) s 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 du	Iration of use
Duration of activity	<8 hour(s)
Technical conditions and measur	es 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 condition	s affecting workers exposure
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm <sup>2</sup> )
Contributing scenario controlling PROC8a Manual cleaning and mair	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and du	iration of use
	<pre>station of use </pre> <pre></pre> <pr< td=""></pr<>

General ventilation	Basic general ventilation (1-3 air changes per hour)		
Containment	No.	No.	
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]		
Occupational Health and Safety Management System	Advanced		
Conditions and measures related	to personal protection, hygiene and hea	alth evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effect	ctiveness - Dermal: 90%]	
Respiratory protection	No. [Effectiveness - Inhalation: 0%]		
Eye Protection	Safety spectacles/goggles/full face shiel	d	
Other given operational condition	s affecting workers exposure		
Place of use	Indoor use		
Process temperature (for solid)	Ambient		
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	Two hands (960 cm <sup>2</sup> )	
Section 3: Exposure estimation a	nd reference to its source		
Contributing scenario controlling ERC6b Use at industrial site	environmental exposure (1)		
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 <sup>-4</sup> mg/m <sup>3</sup>	< 0.01	
Man via Environment - Oral	0.018 mg/kg bw/day	< 0.01	
Contributing scenario controlling PROC2 Application of dyestuffs in c	worker exposure (1) losed system with occasional controlled ex	posure	
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	
Inholation Quatanzia offecto Acuto	0.04 mg/m <sup>3</sup>	< 0.01	
Inhalation, Systemic effects, Acute			
Inhalation, Systemic effects, Acute Inhalation, Local effects, Long Term	0.01 mg/m <sup>3</sup>	< 0.01	

Dermal, Systemic effects, Long Term	0.137 mg/kg bw/day	0.068
Dermal, Local effects, Long Term	0.02 mg/cm <sup>2</sup>	0.02
Combined routes, Systemic effects, Long Term	-	0.07
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling w PROC8b Raw material receipt and tra		
Method: TRA Worker v3		
Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Inhalation, Systemic effects, Long Term	0.1 mg/m <sup>3</sup>	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m <sup>3</sup>	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m <sup>3</sup>	< 0.01
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.704
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling v PROC5 Preparation of dyestuffs appli		
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/m <sup>3</sup>	0.013
Inhalation, Local effects, Long Term	0.35 mg/m³	0.011
Inhalation, Local effects, Acute	1.4 mg/m <sup>3</sup>	0.013
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.2 mg/cm <sup>2</sup>	0.2
Combined routes, Systemic effects, Long Term	-	0.751 143

effects, Acute	-	0.013
Contributing scenario controlling wo PROC8a Batch loading of equipment (m		
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/m <sup>3</sup>	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 <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling wo PROC7 Spray coating- any technique	rker exposure (5)	
Method: TRA Worker v3		
Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
	Exposure concentration 0.035 mg/m <sup>3</sup>	Risk characterisation ratio
effects Inhalation, Systemic effects,		
effects Inhalation, Systemic effects, Long Term	0.035 mg/m <sup>3</sup>	< 0.01
effects     Inhalation, Systemic effects, Long Term       Inhalation, Systemic effects, Acute       Inhalation, Local effects, Acute	0.035 mg/m <sup>3</sup>	< 0.01
effectsInhalation, Systemic effects, Long TermInhalation, Systemic effects, AcuteInhalation, Local effects, Long Term	0.035 mg/m <sup>3</sup> 0.14 mg/m <sup>3</sup> 0.035 mg/m <sup>3</sup>	< 0.01 < 0.01 < 0.01
effectsInhalation, Systemic effects, Long TermInhalation, Systemic effects, AcuteInhalation, Local effects, Long TermInhalation, Local effects, AcuteDermal, Systemic effects,	0.035 mg/m <sup>3</sup> 0.14 mg/m <sup>3</sup> 0.035 mg/m <sup>3</sup> 0.14 mg/m <sup>3</sup>	< 0.01 < 0.01 < 0.01 < 0.01
effectsInhalation, Systemic effects, Long TermInhalation, Systemic effects, AcuteInhalation, Local effects, Long TermInhalation, Local effects, AcuteDermal, Systemic effects, Long TermDermal, Local effects, Long TermCombined routes, Systemic	0.035 mg/m <sup>3</sup> 0.14 mg/m <sup>3</sup> 0.035 mg/m <sup>3</sup> 0.14 mg/m <sup>3</sup> 0.107 mg/kg bw/day	< 0.01 < 0.01 < 0.01 < 0.01 < 0.01 0.054
effectsInhalation, Systemic effects, Long TermInhalation, Systemic effects, AcuteInhalation, Local effects, Long TermInhalation, Local effects, AcuteDermal, Systemic effects, Long Term	0.035 mg/m <sup>3</sup> 0.14 mg/m <sup>3</sup> 0.035 mg/m <sup>3</sup> 0.14 mg/m <sup>3</sup> 0.107 mg/kg bw/day	< 0.01 < 0.01 < 0.01 < 0.01 0.054 < 0.01
effectsInhalation, Systemic effects, Long TermInhalation, Systemic effects, AcuteInhalation, Local effects, Long TermInhalation, Local effects, AcuteDermal, Systemic effects, Long TermDermal, Local effects, Long TermCombined routes, Systemic effects, Long TermCombined routes, SystemicCombined routes, Systemic	0.035 mg/m <sup>3</sup> 0.14 mg/m <sup>3</sup> 0.035 mg/m <sup>3</sup> 0.14 mg/m <sup>3</sup> 0.107 mg/kg bw/day 0.005 mg/cm <sup>2</sup> - -	<ul> <li>&lt; 0.01</li> <li>&lt; 0.01</li> <li>&lt; 0.01</li> <li>&lt; 0.01</li> <li>&lt; 0.01</li> <li>0.054</li> <li>&lt; 0.01</li> <li>0.06</li> </ul>

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 <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.78
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling w PROC13 Treatment of articles by dipp		
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/m <sup>3</sup>	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m <sup>3</sup>	< 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 <sup>2</sup>	0.2
Combined routes, Systemic effects, Long Term	-	0.704
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling w PROC2 Curing and drying processes a		
Contributing scenario controlling w PROC2 Curing and drying processes a		
Contributing scenario controlling w		Risk characterisation ratio
Contributing scenario controlling w PROC2 Curing and drying processes a Method: TRA Worker v3 Route of exposure and type of	after application- elevated temperature	Risk characterisation ratio

Inhalation, Local effects, Long Term	0.01 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.04 mg/m <sup>3</sup>	< 0.01
Dermal, Systemic effects, Long Term	0.137 mg/kg bw/day	0.068
Dermal, Local effects, Long Term	0.02 mg/cm <sup>2</sup>	0.02
Combined routes, Systemic effects, Long Term	-	0.07
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling w PROC8a Manual cleaning and mainte		
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 <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Section 4: Guidance to DU to evalu	ate whether he works inside the bound	daries set by the ES
No additional risk management measu workers.	ures, besides those that are mentioned a	bove, are needed to guarantee safe use for

# Exposure Scenario 15: Formulation - construction products

Section 1: Title of exposure scena	ario
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 PROC8b 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
<b>Contributing scenario controlling</b> ERC2 Formulation of preparations	environmental exposure (1)
Amounts used, Frequency and du	iration 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 <sup>3</sup> m <sup>3</sup> /days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related	to external treatment of waste for disposal
	ste treatment operations: No (low risk) (ERC based assessment demonstrating control isk assumed for waste life stage. Waste disposal according to national/local legislation
Other given operational condition	s affecting environmental exposure
Receiving surface water flow	≥ 1.8 X 10 <sup>4</sup> m³/days
Contributing scenario controlling PROC1 Use in closed process, no li	• • • •
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in	Substance as such 147/

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mixture		
Amounts used, Frequency and d	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measu	res 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	t opersonal 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 condition	ns 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 <sup>2</sup> )	
Contributing scenario controlling PROC2 Use in closed, continuous	g worker exposure (2) process with occasional controlled exposure	
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and d	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measu	res 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	t o 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	_

Place of use	Indoor use	
Process temperature (for solid)	Elevated temperature < melting point	
Skin surface potentially exposed	Two hands face (480 cm <sup>2</sup> )	
Contributing scenario controlling PROC4 Use in batch and other proc	worker exposure (3) cess (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 de	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measur	es 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 condition	s 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 <sup>2</sup> )	
Contributing scenario controlling PROC8b Receiving and charging of		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and de	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measur	es 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%]	149/

	Alternard	
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 condition	as affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Elevated temperature < melting point	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Contributing scenario controlling PROC3 Mixing, dispersing, complet		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and du	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measur	es 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 condition	s 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 <sup>2</sup> )	
Contributing scenario controlling PROC5 Mixing, dispersing and com	worker exposure (6) pletion in open multistage batch process	
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in	Substance as such	150

mixture		
Amounts used, Frequency and d	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measu	res 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	t o 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 conditio	ns 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 <sup>2</sup> )	
Contributing scenario controlling PROC8a Transfer in non-dedicated		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and d	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measu	res 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%]	
	Safety spectacles/goggles/full face shield	
Eye Protection	Salety speciacies/goggles/full lace shield	

Place of use	Indoor use	
Process temperature (for solid)	Elevated temperature < melting point	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Contributing scenario controlling PROC8b Transfer at dedicated facil	• • • • • • • • • • • • • • • • • • • •	
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and de	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measur	es 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 condition	s affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Elevated temperature < melting point	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Contributing scenario controlling PROC9 Filling small containers in d		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and de	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measur	res 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%]	152/

Occupational Health and Safety Management System	Advanced	
	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 condition	s 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 <sup>2</sup> )	
Contributing scenario controlling PROC8a Maintenance and cleaning		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and de	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measur	es 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 condition	s affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Elevated temperature < melting point	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Contributing scenario controlling PROC15 Use as laboratory reagent	• • • •	
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in	Substance as such	153/

mixture			
Amounts used, Frequency and du	iration of use		
Duration of activity	<8 hour(s)		
Technical conditions and measur	es to control dispersion from source to	wards the worker	
General ventilation	Basic general ventilation (1-3 air chang	es 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 he	alth evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effe	ctiveness - Dermal: 80%]	
Respiratory protection	No. [Effectiveness - Inhalation: 0%]		
Eye Protection	Safety spectacles/goggles/full face shie	ld	
Other given operational condition	s affecting workers exposure		
Place of use	Indoor use		
Process temperature (for solid)	Elevated temperature < melting point	Elevated temperature < melting point	
Skin surface potentially exposed	One hand face only (240 cm <sup>2</sup> )		
Section 3: Exposure estimation a	nd reference to its source		
Contributing scenario controlling ERC2 Formulation of preparations	environmental exposure (1)		
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 <sup>3</sup>	< 0.01	
Man via Environment - Oral	0.417 mg/kg bw/day	0.07	
Contributing scenario controlling PROC1 Use in closed process, no li	• • • • •	,	
Method: TRA Worker v3			
Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio	
Inhalation, Systemic effects,	0.01 mg/m <sup>3</sup>	<0.01	154

Long Term		
Inhalation, Systemic effects, Acute	0.04 mg/m <sup>3</sup>	<0.01
Inhalation, Local effects, Long Term	0.01 mg/m³	<0.01
Inhalation, Local effects, Acute	0.04 mg/m <sup>3</sup>	<0.01
Dermal, Systemic effects, Long Term	0.007 mg/kg bw/day	<0.01
Dermal, Local effects, Long Term	0.002 mg/cm <sup>2</sup>	<0.01
Combined routes, Systemic effects, Long Term	-	<0.01
Combined routes, Systemic effects, Acute	-	<0.01
<b>Contributing scenario controlling w</b> PROC2 Use in closed, continuous pro	vorker exposure (2) press with occasional controlled exposure	9
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/m <sup>3</sup>	<0.01
Inhalation, Local effects, Long Term	0.01 mg/m³	<0.01
Inhalation, Local effects, Acute	0.04 mg/m <sup>3</sup>	<0.01
Dermal, Systemic effects, Long Term	0.274 mg/kg bw/day	0.137
Dermal, Local effects, Long Term	0.04 mg/cm <sup>2</sup>	0.04
Combined routes, Systemic effects, Long Term	-	0.139
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling w PROC4 Use in batch and other proces	vorker exposure (3) ss (synthesis) where opportunity for expo	sure 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/m <sup>3</sup>	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
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Dermal, Systemic effects, Long Term	1.372 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.2 mg/cm <sup>2</sup>	0.2
Combined routes, Systemic effects, Long Term	-	0.78
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling w PROC8b Receiving and charging of the		
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/m <sup>3</sup>	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m <sup>3</sup>	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m <sup>3</sup>	< 0.01
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.704
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling w PROC3 Mixing, dispersing, completion		
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/m <sup>3</sup>	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m <sup>3</sup>	< 0.01
Dermal, Systemic effects, Long Term	0.069 mg/kg bw/day	0.034
Dermal, Local effects, Long Term	0.02 mg/cm <sup>2</sup>	0.02
Combined routes, Systemic effects, Long Term	-	0.053

effects, Acute	-	< 0.01
Contributing scenario controlling wo PROC5 Mixing, dispersing and completi		
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/m <sup>3</sup>	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.2 mg/cm <sup>2</sup>	0.2
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling wo PROC8a Transfer in non-dedicated faci		
Method: TRA Worker v3		
Method: TRA Worker v3 Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Route of exposure and type of	Exposure concentration 0.5 mg/m <sup>3</sup>	Risk characterisation ratio
Route of exposure and type of effects         Inhalation, Systemic effects,		
Route of exposure and type of effects       Inhalation, Systemic effects, Long Term	0.5 mg/m <sup>3</sup>	0.094
Route of exposure and type of effectsImage: Second	0.5 mg/m <sup>3</sup>	0.094
Route of exposure and type of effectsInhalation, Systemic effects, Long TermInhalation, Systemic effects, AcuteInhalation, Systemic effects, AcuteInhalation, Local effects, Long Term	0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup> 0.5 mg/m <sup>3</sup>	0.094 0.019 0.016
Route of exposure and type of effectsInhalation, Systemic effects, Long TermInhalation, Systemic effects, AcuteInhalation, Local effects, Long TermInhalation, Local effects, AcuteDermal, Systemic effects,	0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup> 0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup>	0.094 0.019 0.016 0.019
Route of exposure and type of effectsInhalation, Systemic effects, Long TermInhalation, Systemic effects, AcuteInhalation, Local effects, Long TermInhalation, Local effects, AcuteDermal, Systemic effects, Long Term	0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup> 0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup> 1.371 mg/kg bw/day	0.094 0.019 0.016 0.019 0.019 0.686
Route of exposure and type of effectsInhalation, Systemic effects, Long TermInhalation, Systemic effects, AcuteInhalation, Local effects, Long TermInhalation, Local effects, AcuteDermal, Systemic effects, Long TermDermal, Local effects, Long TermCombined routes, Systemic	0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup> 0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup> 1.371 mg/kg bw/day	0.094 0.019 0.016 0.019 0.686 0.1
Route of exposure and type of effectsInhalation, Systemic effects, Long TermInhalation, Systemic effects, AcuteInhalation, Local effects, Long TermInhalation, Local effects, AcuteDermal, Systemic effects, Long TermDermal, Local effects, Long TermCombined routes, Systemic effects, Long TermCombined routes, Systemic	0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup> 0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup> 1.371 mg/kg bw/day 0.1 mg/cm <sup>2</sup> - - rker exposure (8)	0.094 0.019 0.016 0.019 0.686 0.1 0.779

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 <sup>2</sup>	0.05
Combined routes, Systemic effects, Long Term	-	0.356
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling w PROC9 Filling small containers in ded	,	
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/m <sup>3</sup>	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m <sup>3</sup>	< 0.01
Dermal, Systemic effects, Long Term	0.686 mg/kg bw/day	0.343
Dermal, Local effects, Long Term	0.1 mg/cm <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.362
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling w		
PROC8a Maintenance and cleaning o	perations	

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/m <sup>3</sup>	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m <sup>3</sup>	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling w PROC15 Use as laboratory reagent	vorker exposure (11)	
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 <sup>2</sup>	0.02
Combined routes, Systemic effects, Long Term	-	0.053
Combined routes, Systemic effects, Acute	-	< 0.01
Section 4: Guidance to DU to evalu	ate whether he works inside the boun	daries set by the ES
No additional risk management meas workers.	ures, besides those that are mentioned a	bove, are needed to guarantee safe use for

### 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 ERC7 Use at industrial site	environmental exposure (1)	
Amounts used, Frequency and du	ration 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	harge rate of STP $\geq 2 \times 10^3 \text{ m}^3/\text{days}$	
Application of the STP sludge on agricultural soil	Yes	
Conditions and measures related	to external treatment of waste for disposal	
	te treatment operations: No (low risk) (ERC based assessment demonstrating control sk assumed for waste life stage. Waste disposal according to national/local legislation	
Other given operational condition	s affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10 <sup>4</sup> m³/days	
Contributing scenario controlling PROC8b Raw material receipt and tr		

Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	>25%	
Solid in solid mixtures	Yes	
Amounts used, Frequency and du	ration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measure	es 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	s affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Contributing scenario controlling PROC3 Use in closed batch process	,	
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 measure	es 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 condition	s affecting workers exposure
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	One hand face only (240 cm <sup>2</sup> )
Contributing scenario controlling PROC2 Use in closed, continuous p	worker exposure (3) rocess 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 du	iration of use
Duration of activity	<8 hour(s)
Technical conditions and measur	es 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 condition	s affecting workers exposure
Place of use	Indoor use
Process temperature (for solid)	Ambient
	Two hands face (480 cm <sup>2</sup> )

Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and du	ration of use
Duration of activity	<8 hour(s)
Technical conditions and measure	s 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	o 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	s affecting workers exposure
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm <sup>2</sup> )
Contributing scenario controlling PROC6 Calendering operations	worker exposure (5)
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and du	ration of use
Duration of activity	<8 hour(s)
Technical conditions and measure	s 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 163

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	s affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Contributing scenario controlling PROC8a Transfer in non-dedicated f	,	
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	>25%	
Solid in solid mixtures	Yes	
Amounts used, Frequency and du	ration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measure	es 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 <sup>2</sup> )	
Contributing scenario controlling PROC8a Maintenance and cleaning		
Product (article) characteristic		
Dustiness of material	Low	

Concentration of substance in mixture	>25%		
Solid in solid mixtures	Yes		
Amounts used, Frequency and d	uration of use		
Duration of activity	<8 hour(s)		
Technical conditions and measu	res to control dispersion from source to	wards the worker	
General ventilation	Basic general ventilation (1-3 air chang	es 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 he	alth evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effe	ctiveness - Dermal: 90%]	
Respiratory protection	No. [Effectiveness - Inhalation: 0%]		
Eye Protection	Safety spectacles/goggles/full face shie	ld	
Other given operational condition	ns affecting workers exposure		
Place of use	Indoor use		
Process temperature (for solid)	Ambient		
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	Two hands (960 cm <sup>2</sup> )	
Section 3: Exposure estimation a	nd reference to its source		
Contributing scenario controlling ERC7 Use at industrial site	environmental exposure (1)		
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 <sup>-4</sup> mg/m <sup>3</sup>	< 0.01	
Man via Environment - Oral	0.018 mg/kg bw/day	< 0.01	
Contributing scenario controlling PROC8b Raw material receipt and			
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/m <sup>3</sup>	< 0.01
Inhalation, Local effects, Long Term	0.07 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.28 mg/m <sup>3</sup>	< 0.01
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.699
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling wo PROC3 Use in closed batch process (st		
Method: TRA Worker v3		Γ
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/m <sup>3</sup>	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m <sup>3</sup>	< 0.01
Dermal, Systemic effects, Long Term	0.069 mg/kg bw/day	0.034
Dermal, Local effects, Long Term	0.02 mg/cm <sup>2</sup>	0.02
Combined routes, Systemic effects, Long Term	-	0.053
Combined routes, Systemic effects, Acute	-	< 0.01
,		
Contributing scenario controlling wo PROC2 Use in closed, continuous proce	• • • •	2

effects	Exposure concentration	Risk characterisation ratio
Inhalation, Systemic effects, Long Term	0.01 mg/m³	< 0.01
Inhalation, Systemic effects, Acute	0.04 mg/m <sup>3</sup>	< 0.01
Inhalation, Local effects, Long Term	0.01 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.04 mg/m <sup>3</sup>	< 0.01
Dermal, Systemic effects, Long Term	0.137 mg/kg bw/day	0.068
Dermal, Local effects, Long Term	0.02 mg/cm <sup>2</sup>	0.02
Combined routes, Systemic effects, Long Term	-	0.07
Combined routes, Systemic effects, Acute	-	< 0.01
contact)	vorker exposure (4) rocesses for formulation of preparations a	and articles (multistage and/or significant
Method: TRA Worker v3		
Route of exposure and type of	Exposure concentration	
effects	Exposure concentration	Risk characterisation ratio
	0.5 mg/m <sup>3</sup>	0.094
effects Inhalation, Systemic effects,		
effects Inhalation, Systemic effects, Long Term	0.5 mg/m <sup>3</sup>	0.094
effects Inhalation, Systemic effects, Long Term Inhalation, Systemic effects, Acute Inhalation, Local effects,	0.5 mg/m <sup>3</sup>	0.094
effects Inhalation, Systemic effects, Long Term Inhalation, Systemic effects, Acute Inhalation, Local effects, Long Term	0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup> 0.5 mg/m <sup>3</sup>	0.094 0.019 0.016
effects Inhalation, Systemic effects, Long Term Inhalation, Systemic effects, Acute Inhalation, Local effects, Long Term Inhalation, Local effects, Acute Dermal, Systemic effects,	0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup> 0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup>	0.094 0.019 0.016 0.019
effects Inhalation, Systemic effects, Long Term Inhalation, Systemic effects, Acute Inhalation, Local effects, Acute Inhalation, Local effects, Acute Dermal, Systemic effects, Long Term	0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup> 0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup> 1.371 mg/kg bw/day	0.094 0.019 0.016 0.019 0.019 0.686
effects Inhalation, Systemic effects, Long Term Inhalation, Systemic effects, Acute Inhalation, Local effects, Acute Inhalation, Local effects, Acute Dermal, Systemic effects, Long Term Dermal, Local effects, Long Term Combined routes, Systemic	0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup> 0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup> 1.371 mg/kg bw/day	0.094 0.019 0.016 0.019 0.686 0.2
effectsInhalation, Systemic effects, Long TermInhalation, Systemic effects, AcuteInhalation, Local effects, Long TermInhalation, Local effects, AcuteDermal, Systemic effects, Long TermDermal, Local effects, Long TermCombined routes, Systemic effects, Long TermCombined routes, SystemicCombined routes, Systemic	0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup> 0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup> 1.371 mg/kg bw/day 0.2 mg/cm <sup>2</sup> -	0.094 0.019 0.016 0.019 0.019 0.686 0.2 0.779

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/m <sup>3</sup>	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m <sup>3</sup>	< 0.01
Dermal, Systemic effects, Long Term	1.372 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.704
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling w PROC8a Transfer in non-dedicated fa	• • • • • • • • • • • • • • • • • • • •	
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 <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic	-	0.019
effects, Acute		
effects, Acute Contributing scenario controlling w PROC8a Maintenance and cleaning o		

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 <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Section 4: Guidance to DU to evalu	late whether he works inside the boun	daries set by the ES
No additional risk management meas workers.	sures, besides those that are mentioned a	above, are needed to guarantee safe use for

# 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 ERC 8f Professional use of building	• • • • • • • • • • • • • • • • • • • •
Amounts used, Frequency and du	ration of use
Daily use at site	≤ 8.25 X 10 <sup>-5</sup> 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 <sup>3</sup> m³/days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related	to external treatment of waste for disposal
	ste treatment operations: No (low risk) (ERC based assessment demonstrating control isk assumed for waste life stage. Waste disposal according to national/local legislation
Other given operational condition	ns affecting environmental exposure
Receiving surface water flow	≥ 1.8 X 10 <sup>4</sup> m <sup>3</sup> /days
Contributing scenario controlling PROC8a Transfer in non-dedicated	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and de	uration of use
Duration of activity	<8 hour(s)
Technical conditions and measur	es 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 condition	s affecting workers exposure
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )
Contributing scenario controlling PROC5 Mixing operations	worker exposure (2)
Product (article) characteristic	

Dustiness of material	Low	
Concentration of substance in mixture	>25%	
Solid in solid mixtures	Yes	
Amounts used, Frequency and d	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measu	res 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 condition	ns affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Contributing scenario controlling PROC14 Article preparation	y worker exposure (3)	
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	>25%	
Solid in solid mixtures	Yes	
Amounts used, Frequency and d	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measu	res 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	4741
		171/2

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 condition	is affecting workers exposure
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm <sup>2</sup> )
Contributing scenario controlling PROC24 High energy processing	worker exposure (4)
Product (article) characteristic	
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and du	uration of use
Duration of activity	<8 hour(s)
Technical conditions and measur	es 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 condition	ns 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 <sup>2</sup> )
Contributing scenario controlling PROC8a Maintenance and cleaning	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%

Duration of activity	<8 hour(s)	
,		
	es to control dispersion from source tow	
General ventilation	Basic general ventilation (1-3 air changes	s 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 heal	th evaluation
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effect	iveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]	
Eye Protection	Safety spectacles/goggles/full face shield	
Other given operational condition	ns affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Section 3: Exposure estimation a	nd reference to its source	
Contributing scenario controlling ERC 8f Professional use of building	• • • • • •	
Release route	Release rate	Release estimation method
Water	8.25 X 10 <sup>-4</sup> kg/day	ERC based
Air	0.012 kg/day	ERC based
Soil	4.125 X 10 <sup>-4</sup> kg/day	ERC based
Protection target	Exposure estimation	Risk characterisation ratio
Fresh water	2.692 X 10 <sup>-4</sup> mg/L	< 0.01
Sea water	2.573 X 10 <sup>-5</sup> mg/L	< 0.01
Sewage treatment plant	5.221 X 10 <sup>-5</sup> mg/L	< 0.01
Man via Environment - Inhalation	2.912 X 10 <sup>-11</sup> mg/m <sup>3</sup>	< 0.01
Man via Environment - Oral	7.287 X 10 <sup>-5</sup> mg/kg bw/day	< 0.01
	· · · · · · · · · · · · · · · · · · ·	
Contributing scenario controlling PROC8a Transfer in non-dedicated	• • • • • • • • • • • • • • • • • • • •	

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 <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling wor PROC5 Mixing operations	ker exposure (2)	
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 <sup>2</sup>	0.2
Combined routes, Systemic effects, Long Term	-	0.873
Combined routes, Systemic effects, Acute	-	0.038
	ther exposure (3)	<u> </u>
Contributing scenario controlling wor PROC14 Article preparation		

Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Inhalation, Systemic effects, Long Term	1 mg/m <sup>3</sup>	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 <sup>2</sup>	0.05
Combined routes, Systemic effects, Long Term	-	0.359
Combined routes, Systemic effects, Acute	-	0.038
Contributing scenario controlling wo PROC24 High energy processing	orker exposure (4)	
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
Demand I and offerster I ameri Teman	0.01 mg/cm <sup>2</sup>	0.01
Dermal, Local effects, Long Term	ere i nig/eni	
Combined routes, Systemic	-	0.517
Dermal, Local effects, Long Term Combined routes, Systemic effects, Long Term Combined routes, Systemic effects, Acute	-	0.517
Combined routes, Systemic effects, Long Term Combined routes, Systemic	- - Drker exposure (5)	

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/m <sup>3</sup>	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 <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Section 4: Guidance to DU to evalu	ate whether he works inside the boun	daries set by the ES
No additional risk management meas workers.	ures, besides those that are mentioned a	above, are needed to guarantee safe use for

#### 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; S 5; SU 6b; SU 11; SU 12; SU 13; SU 16; SU 17; SU 18; SU 19; SU 0	SU
	ES 26 Service life (consumers); Service life articles used by consumers	
Section 2: Operational conditions	of use	
Contributing scenario controlling ERC8f Consumer building product u	• • • • • • • • • • • • • • • • • • • •	
Amounts used, Frequency and du	ration of use	
Daily wide dispersive use	≤ 8.25 X 10 <sup>-5</sup> 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	$\geq$ 2 X 10 <sup>3</sup> m <sup>3</sup> /days	176/

Application of the STP sludge on agricultural soil	Yes	
Conditions and measures related t	o external treatment of waste for dispo	osal
		C based assessment demonstrating control sposal according to national/local legislation
Other given operational conditions	affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10 <sup>4</sup> m <sup>3</sup> /days	
Contributing scenario controlling of PC0 Use of building products	consumer exposure (1)	
Product (article) characteristic		
Product/ Article subcategory	No value	
Concentration of substance in mixture	0.1 g/g	
Section 3: Exposure estimation an	d reference to its source	
Contributing scenario controlling e ERC8f Consumer building product us		
Release route	Release rate	Release estimation method
Water	8.25 X 10 <sup>-4</sup> kg/day	ERC based
Air	0.012 kg/day	ERC based
Soil	4.125 X 10 <sup>-4</sup> kg/day	ERC based
Protection target	Exposure estimation	Risk characterisation ratio
Fresh water	2.692 X 10 <sup>-4</sup> mg/L	<0.01
Sea water	2.573 X 10 <sup>-5</sup> mg/L	<0.01
Sewage treatment plant	5.221 X 10 <sup>-5</sup> mg/L	<0.01
Man via Environment - Inhalation	2.912 X 10 <sup>-11</sup> mg/m <sup>3</sup>	<0.01
Man via Environment - Oral	7.287 X 10 <sup>-5</sup> mg/kg bw/day	<0.01
Contributing scenario controlling of PC0 Use of building products	consumer exposure (1)	
Not available		
Section 4: Guidance to DU to evalu	ate whether he works inside the boun	daries set by the ES
No additional risk management meas workers.	sures, besides those that are mentioned a	bove, are needed to guarantee safe use for

# 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	
<b>Contributing scenario controlling</b> ERC2 Formulation of preparations	environmental exposure (1)	
Amounts used, Frequency and du	ration 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 <sup>3</sup> m <sup>3</sup> /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	s affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10 <sup>4</sup> m <sup>3</sup> /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 d	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measured	res 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 condition	s 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 <sup>2</sup> )	
Contributing scenario controlling PROC2 Use in closed, continuous	worker exposure (2) process with occasional controlled exposure	
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and d	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measu	res 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%]	179

	1
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational condition	s 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 <sup>2</sup> )
Contributing scenario controlling PROC4 Use in batch and other proc	worker exposure (3) ess (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 du	ration of use
Duration of activity	<8 hour(s)
Technical conditions and measure	es 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 condition	s 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 <sup>2</sup> )
<b>Contributing scenario controlling</b> PROC8b Receiving and charging of	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and du	ration of use
Duration of activity	<8 hour(s)
	180

Technical conditions and measu	res 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 condition	ns affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Elevated temperature < melting point	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Contributing scenario controlling PROC3 Mixing, dispersing, comple		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and d	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measu	res 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 condition	ns affecting workers exposure	
Place of use	Indoor use	
Place of use Process temperature (for solid)	Indoor use Elevated temperature < melting point	

Product (article) characteristic		
Dustiness of material	1	
	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and du	ration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measure	s 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 t	o 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	s 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 <sup>2</sup> )	
Contributing scenario controlling PROC9 Filling small containers in de		
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 measure	es 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%]	

Conditions and measures related t	o 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 <sup>2</sup> )	
Contributing scenario controlling v PROC8a Transfer in non-dedicated fa	• • • • • • • • • • • • • • • • • • • •	
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and dur	ation of use	
Duration of activity	<8 hour(s)	
Technical conditions and measure	s 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 t	o 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 <sup>2</sup> )	
Contributing scenario controlling v PROC8b Transfer at dedicated faciliti		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	183

Amounts used, Frequency and d	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measu	res 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	t opersonal 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 condition	ns affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Contributing scenario controlling PROC8a Maintenance and cleaning		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and d	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measu	res 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	t o 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 condition	ns affecting workers exposure	

Process temperature (for solid)	Elevated temperature < melting point	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Contributing scenario controlling PROC15 Use as laboratory reagent	• • • •	
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and du	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measur	es to control dispersion from source to	owards the worker
General ventilation	Basic general ventilation (1-3 air chang	jes 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 he	ealth evaluation
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effe	ectiveness - Dermal: 80%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]	
Eye Protection	Safety spectacles/goggles/full face shi	eld
Other given operational condition	as 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 <sup>2</sup> )	
Section 3: Exposure estimation a	nd reference to its source	
Contributing scenario controlling ERC2 Formulation of preparations	environmental exposure (1)	
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 <sup>-4</sup> mg/m <sup>3</sup>	< 0.01

Man via Environment - Oral	0.101 mg/kg bw/day	0.017
Contributing scenario controlling wo PROC1 Use in closed process, no likeli	• • • •	
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/m <sup>3</sup>	<0.01
Inhalation, Local effects, Long Term	0.01 mg/m³	<0.01
Inhalation, Local effects, Acute	0.04 mg/m <sup>3</sup>	<0.01
Dermal, Systemic effects, Long Term	0.007 mg/kg bw/day	<0.01
Dermal, Local effects, Long Term	0.002 mg/cm <sup>2</sup>	<0.01
Combined routes, Systemic effects, Long Term	-	<0.01
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling wo PROC2 Use in closed, continuous proc		
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/m <sup>3</sup>	<0.01
Inhalation, Local effects, Long Term	0.01 mg/m³	<0.01
Inhalation, Local effects, Acute	0.04 mg/m <sup>3</sup>	<0.01
Dermal, Systemic effects, Long Term	0.274 mg/kg bw/day	0.137
Dermal, Local effects, Long Term	0.04 mg/cm <sup>2</sup>	0.04
Combined routes, Systemic effects, Long Term	-	0.139
Combined routes, Systemic effects, Acute	-	<0.01

Method: TRA Worker v3	/lethod: 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 <sup>2</sup>	0.2	
Combined routes, Systemic effects, Long Term	-	0.78	
Combined routes, Systemic effects, Acute	-	0.019	
Contributing scenario controlling v PROC8b Receiving and charging of t	• • • • • • • • • • • • • • • • • • • •		
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/m <sup>3</sup>	< 0.01	
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686	
Dermal, Local effects, Long Term	0.1 mg/cm <sup>2</sup>	0.1	
Combined routes, Systemic effects, Long Term	-	0.704	

Method: TRA Worker v3	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 <sup>2</sup>	0.02	
Combined routes, Systemic effects, Long Term	-	0.053	
Combined routes, Systemic	-	< 0.01	
effects, Acute			
Contributing scenario controlling	worker exposure (6) oletion in open multistage batch process		
Contributing scenario controlling PROC5 Mixing, dispersing and comp			
Contributing scenario controlling PROC5 Mixing, dispersing and comp Method: TRA Worker v3 Route of exposure and type of		Risk characterisation ratio	
Contributing scenario controlling	oletion in open multistage batch process	Risk characterisation ratio	
Contributing scenario controlling PROC5 Mixing, dispersing and comp Method: TRA Worker v3 Route of exposure and type of effects Inhalation, Systemic effects, Long Term	Exposure concentration		
Contributing scenario controlling PROC5 Mixing, dispersing and comp Method: TRA Worker v3 Route of exposure and type of effects Inhalation, Systemic effects, Long Term Inhalation, Systemic effects, Acute Inhalation, Local effects,	Exposure concentration 0.5 mg/m <sup>3</sup>	0.094	
Contributing scenario controlling PROC5 Mixing, dispersing and comp Method: TRA Worker v3 Route of exposure and type of effects Inhalation, Systemic effects, Long Term Inhalation, Systemic effects, Acute Inhalation, Local effects, Long Term	Exposure concentration         0.5 mg/m³         2 mg/m³	0.019	
Contributing scenario controlling PROC5 Mixing, dispersing and comp Method: TRA Worker v3 Route of exposure and type of effects Inhalation, Systemic effects, Long Term Inhalation, Local effects, Acute Inhalation, Local effects, Acute Dermal, Systemic effects,	Exposure concentration         0.5 mg/m³         2 mg/m³         0.5 mg/m³	0.094 0.019 0.016	
Contributing scenario controlling PROC5 Mixing, dispersing and comp Method: TRA Worker v3 Route of exposure and type of effects Inhalation, Systemic effects, Long Term Inhalation, Local effects, Acute Inhalation, Local effects, Acute Dermal, Systemic effects, Long Term	Exposure concentration         0.5 mg/m³         2 mg/m³         0.5 mg/m³         2 mg/m³         2 mg/m³	0.094 0.019 0.016 0.019	
Contributing scenario controlling PROC5 Mixing, dispersing and comp Method: TRA Worker v3 Route of exposure and type of effects Inhalation, Systemic effects, Long Term Inhalation, Systemic effects, Acute	Exposure concentration         0.5 mg/m³         2 mg/m³         0.5 mg/m³         1.371 mg/kg bw/day	0.094 0.019 0.016 0.019 0.019 0.686	

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/m <sup>3</sup>	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m <sup>3</sup>	< 0.01
Dermal, Systemic effects, Long Term	0.686 mg/kg bw/day	0.343
Dermal, Local effects, Long Term	0.1 mg/cm <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.362
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling w PROC8a Transfer in non-dedicated fa	• • • • •	
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/m <sup>3</sup>	0.019
	05 / 3	0.016
Inhalation, Local effects, Long Term	0.5 mg/m³	0.010
	0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup>	0.019
Long Term	Ŭ	
Long Term Inhalation, Local effects, Acute Dermal, Systemic effects,	2 mg/m³	0.019
Long Term Inhalation, Local effects, Acute Dermal, Systemic effects, Long Term	2 mg/m³ 1.371 mg/kg bw/day	0.019 0.686

effects     0.07 mg/m³     0.013       Inhalation, Systemic effects, Acute     0.28 mg/m³     < 0.01       Inhalation, Systemic effects, Acute     0.28 mg/m³     < 0.01       Inhalation, Local effects, Acute     0.28 mg/m³     < 0.01       Inhalation, Local effects, Acute     0.28 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/cm²     0.05       Combined routes, Systemic effects, Long Term     -     0.356       Combined routes, Systemic effects, Acute     -        effects, Acute     -         Combined routes, Systemic effects, Acute       Combined routes, Systemic effects, Acute       PROCBA Maintenance and cleaning operations       Method: TRA Worker v3     Route of exposure and type of effects     Exposure concentration effects       Inhalation, Systemic effects, Acute     2 mg/m³     0.019       Inhalation, Systemic effects, Acute     2 mg/m³     0.019       Inhalation, Local effects, Acute     2 mg/m³     0.019       Inhalation, Local effects, Acute     2 mg/m³     0.016       Inhalation, Systemic effects, Acute     2 mg/m³     0.016       Dorma	Method: TRA Worker v3		
Long Term       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/m²       0.05         Combined routes, Systemic effects, Long Term       0.05 mg/cm²       0.01         Combined routes, Systemic effects, Acute       -       < 0.01         Contributing scenario controlling worker exposure (10)       PRC28a Maintenance and cleaning operations       Resk characterisation rateffects         Method: TRA Worker v3       0.5 mg/m³       0.094       1         Inhalation, Systemic effects, Acute       2 mg/m³       0.019         Inhalation, Systemic effects, Acute       2 mg/m³       0.019         Inhalation, Systemic effects, Acute       2 mg/m³       0.019         Inhalation, Local effects, Acute       2 mg/m³       0.019         Inhalation, Local effects, Long Term       0.1 mg/cm²       0.1         Inhalation, Local effects, Long Term       0.1 mg/cm²       0.1         Inhalation, Local effects, Long Term       0.1 mg/cm²       0.1         Dermal, Local effects, Long Term       <	Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Inhalation, Local effects, Long Term       0.07 mg/m³       < 0.01	Inhalation, Systemic effects, Long Term	0.07 mg/m³	0.013
Long TermInhalation, Local effects, Acute0.28 mg/m³< 0.01Dermal, Systemic effects, Long Term0.686 mg/kg bw/day0.343Dermal, Local effects, Long Term0.05 mg/cm²0.05Combined routes, Systemic effects, Long Term-0.356Combined routes, Systemic effects, Acute-<0.01	Inhalation, Systemic effects, Acute	0.28 mg/m <sup>3</sup>	< 0.01
Dermal, Systemic effects, Long Term       0.686 mg/kg bw/day       0.343         Dermal, Local effects, Long Term       0.05 mg/cm²       0.05         Combined routes, Systemic effects, Long Term       -       0.356         Combined routes, Systemic effects, Acute       -       <0.01		0.07 mg/m³	< 0.01
Long Term0.05 mg/cm²0.05Dermal, Local effects, Long Term0.05 mg/cm²0.05Combined routes, Systemic effects, Long Term-0.356Combined routes, Systemic effects, Acute-<0.01	Inhalation, Local effects, Acute	0.28 mg/m <sup>3</sup>	< 0.01
Combined routes, Systemic effects, Long Term       0.356         Combined routes, Systemic effects, Acute       -       < 0.01		0.686 mg/kg bw/day	0.343
effects, Long Term          Combined routes, Systemic effects, Acute       -       < 0.01	Dermal, Local effects, Long Term	0.05 mg/cm <sup>2</sup>	0.05
effects, Acute       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 rateffects         Inhalation, Systemic effects, Long Term       0.5 mg/m³       0.094         Inhalation, Local effects, Acute       2 mg/m³       0.019         Inhalation, Local effects, Acute       2 mg/m³       0.016         Long Term       0.5 mg/m³       0.019         Inhalation, Local effects, Acute       2 mg/m³       0.019         Inhalation, Local effects, Acute       2 mg/m³       0.019         Dermal, Systemic effects, Long Term       0.1 mg/cm²       0.1         Combined routes, Systemic effects, Long Term       0.1 mg/cm²       0.1         Combined routes, Systemic effects, Long Term       -       0.779         Combined routes, Systemic effects, Long Term       -       0.019         Combined routes, Systemic effects, Acute       -       0.019         Combined routes, Systemic effects, Acute       -       0.779         Combined routes, Systemic effects, Acute       -       0.019         Combined routes, Systemic effects, Acute       -       0.019         Effects, Acute       - <t< td=""><td></td><td>-</td><td>0.356</td></t<>		-	0.356
PROC8a Maintenance and cleaning operations         Method: TRA Worker v3       Exposure concentration       Risk characterisation rate of exposure and type of effects         Route of exposure and type of effects       Exposure concentration       Risk characterisation rate of exposure and type of effects         Inhalation, Systemic effects, Long Term       0.5 mg/m³       0.094         Inhalation, Systemic effects, Acute       2 mg/m³       0.019         Inhalation, Local effects, Acute       2 mg/m³       0.016         Inhalation, Local effects, Acute       2 mg/m³       0.019         Inhalation, Local effects, Acute       2 mg/m³       0.019         Dermal, Systemic effects, Long Term       0.1 mg/cm²       0.1         Combined routes, Systemic effects, Long Term       0.1 mg/cm²       0.1         Combined routes, Systemic effects, Long Term       0.019       0.019         Combined routes, Systemic effects, Long Term       0.1 mg/cm²       0.1         Combined routes, Systemic effects, Acute       -       0.019         Outes, Systemic effects, Acute       -       0.019         Combined routes, Systemic effects, Acute       -       0.019         Contributing scenario controlling worker exposure (11)       -       0.019	-	-	< 0.01
Route of exposure and type of effectsExposure concentrationRisk characterisation ray field of the second se	PROC8a Maintenance and cleaning op		
effectsInhalation, Systemic effects, Long Term0.5 mg/m³0.094Inhalation, Systemic effects, Acute2 mg/m³0.019Inhalation, Local effects, Acute2 mg/m³0.016Inhalation, Local effects, Acute2 mg/m³0.019Inhalation, Local effects, Acute2 mg/m³0.019Dermal, Systemic effects, Acute2 mg/m³0.019Dermal, Systemic effects, Long Term1.371 mg/kg bw/day0.686Dermal, Local effects, Long Term0.1 mg/cm²0.1Combined routes, Systemic effects, Long Term-0.779Combined routes, Systemic effects, Acute-0.019Combined routes, Systemic effects, Acute-0.019			
Long TermInhalation, Systemic effects, Acute2 mg/m³0.019Inhalation, Local effects, Long Term0.5 mg/m³0.016Inhalation, Local effects, Acute2 mg/m³0.019Dermal, Systemic effects, Long Term1.371 mg/kg bw/day0.686Dermal, Local effects, Long Term0.1 mg/cm²0.1Combined routes, Systemic effects, Long Term-0.779Combined routes, Systemic effects, Acute-0.019Combined routes, Systemic effects, Acute-0.019Combined routes, Systemic effects, Acute-0.019Combined routes, Systemic effects, Acute-0.019		Exposure concentration	Risk characterisation ratio
Inhalation, Local effects, Long Term0.5 mg/m³0.016Inhalation, Local effects, Acute2 mg/m³0.019Dermal, Systemic effects, Long Term1.371 mg/kg bw/day0.686Dermal, Local effects, Long Term0.1 mg/cm²0.1Combined routes, Systemic effects, Long Term-0.779Combined routes, Systemic effects, Acute-0.019Combined routes, Systemic effects, Acute-0.019Combined routes, Systemic effects, Acute-0.019	-	0.5 mg/m³	0.094
Long TermOutputInhalation, Local effects, Acute2 mg/m³0.019Dermal, Systemic effects, Long Term1.371 mg/kg bw/day0.686Dermal, Local effects, Long Term0.1 mg/cm²0.1Combined routes, Systemic effects, Long Term-0.779Combined routes, Systemic effects, Acute-0.019Combined routes, Systemic effects, Acute-0.019Contributing scenario controlling worker exposure (11)	Inhalation, Systemic 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 <sup>2</sup> 0.1       Combined routes, Systemic effects, Long Term     -     0.779       Combined routes, Systemic effects, Acute     -     0.019       Contributing scenario controlling worker exposure (11)     -		0.5 mg/m³	0.016
Long Term       0.1 mg/cm <sup>2</sup> 0.1         Dermal, Local effects, Long Term       0.1 mg/cm <sup>2</sup> 0.1         Combined routes, Systemic effects, Long Term       -       0.779         Combined routes, Systemic effects, Acute       -       0.019         Contributing scenario controlling worker exposure (11)       -       0.019	Inhalation, Local effects, Acute	2 mg/m³	0.019
Combined routes, Systemic     -     0.779       effects, Long Term     0.019       Combined routes, Systemic     -     0.019       effects, Acute     0.019       Contributing scenario controlling worker exposure (11)		1.371 mg/kg bw/day	0.686
effects, Long Term       0.019         Combined routes, Systemic effects, Acute       0.019         Contributing scenario controlling worker exposure (11)       0.019	Dermal, Local effects, Long Term	0.1 mg/cm <sup>2</sup>	0.1
effects, Acute Contributing scenario controlling worker exposure (11)		-	0.779
		-	0.019
PROC15 Use as laboratory reagent	ellecis, Acule		

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/m <sup>3</sup>	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m <sup>3</sup>	< 0.01
Dermal, Systemic effects, Long Term	0.068 mg/kg bw/day	0.034
Dermal, Local effects, Long Term	0.02 mg/cm <sup>2</sup>	0.02
Combined routes, Systemic effects, Long Term	-	0.053
Combined routes, Systemic effects, Acute	-	< 0.01
Section 4: Guidance to DU to evalu	ate whether he works inside the boun	daries set by the ES
No additional risk management meas workers.	sures, besides those that are mentioned a	above, are needed to guarantee safe use for

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

Section 1: Title of exposure scena	rio
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	
<b>Contributing scenario controlling</b> ERC5 Industrial use of coatings and	• • • • • • • • • • • • • • • • • • • •	
Amounts used, Frequency and du		
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	$\geq$ 2 X 10 <sup>3</sup> m <sup>3</sup> /days	
Application of the STP sludge on agricultural soil	Yes	
Conditions and measures related	to external treatment of waste for disposal	
	te treatment operations: No (low risk) (ERC based assessment demonstrating control sk assumed for waste life stage. Waste disposal according to national/local legislation	
Other given operational condition	s affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10 <sup>4</sup> m³/days	
Contributing scenario controlling ERC5 Industrial use of coatings and	• • • • • • • • • • • • • • • • • • • •	
Amounts used, Frequency and du	ration 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	$\geq 2 \times 10^3 \text{ m}^3/\text{days}$	
Application of the STP sludge on agricultural soil	Yes	

Conditions and measures related	to external treatment of waste for disposal
	te treatment operations: No (low risk) (ERC based assessment demonstrating control sk assumed for waste life stage. Waste disposal according to national/local legislation
Other given operational condition	s affecting environmental exposure
Receiving surface water flow	≥ 1.8 X 10 <sup>4</sup> m <sup>3</sup> /days
Contributing scenario controlling PROC2 Application of coatings and	worker exposure (1) 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 du	ration of use
Duration of activity	<8 hour(s)
Technical conditions and measure	es 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 condition	s affecting workers exposure
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm <sup>2</sup> )
Contributing scenario controlling PROC8b Raw material receipt and to	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	5-25%
Solid in solid mixtures	Yes 19
	19.

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Amounts used, Frequency and du	ration of use			
Duration of activity	<8 hour(s)			
Technical conditions and measure	es 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	s affecting workers exposure			
Place of use	Indoor use			
Process temperature (for solid)	Ambient			
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )			
<b>Contributing scenario controlling</b> PROC5 Preparation of coatings and				
Product (article) characteristic				
Dustiness of material	Low			
Concentration of substance in mixture	>25%			
Solid in solid mixtures	Yes			
Amounts used, Frequency and du	ration of use			
Duration of activity	<8 hour(s)			
Technical conditions and measure	es 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	s affecting workers exposure
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm <sup>2</sup> )
Contributing scenario controlling PROC8a Batch loading of equipment	
Product (article) characteristic	
	1
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and du	ration of use
Duration of activity	<8 hour(s)
Technical conditions and measure	s 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 t	o 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	s affecting workers exposure
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )
Contributing scenario controlling PROC7 Spray coating- any technique	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
	I

	ration of use		
Duration of activity	<8 hour(s)		
Technical conditions and measure	es 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	s affecting workers exposure		
Place of use	Indoor use		
Process temperature (for solid)	Ambient		
Skin surface potentially exposed	Two hands and upper wrists (1500 cm <sup>2</sup> )		
<b>Contributing scenario controlling</b> PROC10 Brushing, roller, spreader, t	worker exposure (6) flow coating or printing- any technique		
<b>3</b> <sup>2</sup> <b>1 1</b>			
Product (article) characteristic			
·	Low		
Product (article) characteristic	Low >25%		
Product (article) characteristic Dustiness of material Concentration of substance in			
Product (article) characteristic Dustiness of material Concentration of substance in mixture	>25% Yes		
Product (article) characteristic Dustiness of material Concentration of substance in mixture Solid in solid mixtures	>25% Yes		
Product (article) characteristic Dustiness of material Concentration of substance in mixture Solid in solid mixtures Amounts used, Frequency and du Duration of activity	>25% Yes ration of use		
Product (article) characteristic Dustiness of material Concentration of substance in mixture Solid in solid mixtures Amounts used, Frequency and du Duration of activity	>25%       Yes       ration of use       <8 hour(s)		
Product (article) characteristic Dustiness of material Concentration of substance in mixture Solid in solid mixtures Amounts used, Frequency and du Duration of activity Technical conditions and measure	>25%         Yes         ration of use         <8 hour(s)		
Product (article) characteristic Dustiness of material Concentration of substance in mixture Solid in solid mixtures Amounts used, Frequency and du Duration of activity Technical conditions and measure General ventilation	>25%         Yes         ration of use         <8 hour(s)		
Product (article) characteristic Dustiness of material Concentration of substance in mixture Solid in solid mixtures Amounts used, Frequency and du Duration of activity Technical conditions and measure General ventilation Containment	>25%         Yes         ration of use         <8 hour(s)		
Product (article) characteristic         Dustiness of material         Concentration of substance in mixture         Solid in solid mixtures         Amounts used, Frequency and du         Duration of activity         Technical conditions and measure         General ventilation         Containment         Local exhaust ventilation         Occupational Health and Safety         Management System	>25%         Yes         ration of use         <8 hour(s)		
Product (article) characteristic         Dustiness of material         Concentration of substance in mixture         Solid in solid mixtures         Amounts used, Frequency and du         Duration of activity         Technical conditions and measure         General ventilation         Containment         Local exhaust ventilation         Occupational Health and Safety         Management System	>25%         Yes         ration of use         <8 hour(s)		

Eye Protection	Safety spectacles/goggles/full face shield		
Other given operational conditions	s affecting workers exposure		
Place of use	Indoor use		
Process temperature (for solid)	mbient		
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )		
Contributing scenario controlling PROC13 Treatment of articles by dip	,		
Product (article) characteristic			
Dustiness of material	Low		
Concentration of substance in mixture	>25%		
Solid in solid mixtures	Yes		
Amounts used, Frequency and du	ration of use		
Duration of activity	<8 hour(s)		
Technical conditions and measure	s 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	o 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	s affecting workers exposure		
Place of use	Indoor use		
Process temperature (for solid)	Ambient		
Skin surface potentially exposed	Two hands face (480 cm <sup>2</sup> )		
Contributing scenario controlling PROC2 Curing and drying processes	worker exposure (8) s 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 du	uration of use			
Duration of activity	<8 hour(s)			
Technical conditions and measur	es 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 condition	affecting workers exposure			
Place of use	Indoor use			
Process temperature (for solid)	Ambient			
Skin surface potentially exposed	Two hands face (480 cm <sup>2</sup> )			
Contributing scenario controlling PROC8a Manual cleaning and main				
Product (article) characteristic				
Dustiness of material	Low			
Concentration of substance in mixture	>25%			
Solid in solid mixtures	Yes			
Amounts used, Frequency and du	uration of use			
Duration of activity	<8 hour(s)			
Technical conditions and measur	es 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			

Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Section 3: Exposure estimation a	nd reference to its source	
Contributing scenario controlling ERC5 Industrial use of coatings and		
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 <sup>-4</sup> 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 <sup>3</sup>	< 0.01
Man via Environment - Oral	0.283 mg/kg bw/day	0.047
Contributing scenario controlling ERC5 Industrial use of coatings and		
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 <sup>-4</sup> mg/L	0.022
Sewage treatment plant	0.019 mg/L	< 0.01
Man via Environment - Inhalation	2.919 X 10 <sup>-11</sup> mg/m <sup>3</sup>	< 0.01
Man via Environment - Oral	2.652 X 10 <sup>-4</sup> mg/kg bw/day	< 0.01
Contributing scenario controlling PROC2 Application of coating and in	worker exposure (1) hks in closed system with occasional contro	olled exposure
Method: TRA Worker v3		
Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Inhalation, Systemic effects,	0.01 mg/m <sup>3</sup>	< 0.01
Long Term		199

		1
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/m <sup>3</sup>	< 0.01
Dermal, Systemic effects, Long Term	0.137 mg/kg bw/day	0.068
Dermal, Local effects, Long Term	0.02 mg/cm <sup>2</sup>	0.02
Combined routes, Systemic effects, Long Term	-	0.07
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling v PROC8b Raw material receipt and tra		-
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/m <sup>3</sup>	< 0.01
Inhalation, Local effects, Long Term	0.06 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.24 mg/m <sup>3</sup>	< 0.01
Dermal, Systemic effects, Long Term	0.823 mg/kg bw/day	0.411
Dermal, Local effects, Long Term	0.06 mg/cm <sup>2</sup>	0.06
Combined routes, Systemic effects, Long Term	-	0.423
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling v PROC5 Preparation of coating and in		
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
, , ,	-	

Long Term		
Dermal, Local effects, Long Term	0.2 mg/cm <sup>2</sup>	0.2
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling w PROC8a Batch loading 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/m <sup>3</sup>	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 <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling w PROC7 Spray coating- any technique	orker exposure (5)	
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/m <sup>3</sup>	< 0.01
Inhalation, Local effects, Long Term	0.05 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.2 mg/m <sup>3</sup>	< 0.01
Dermal, Systemic effects, Long Term	0.107 mg/kg bw/day	0.054
Dermal, Local effects, Long Term	0.005 mg/cm <sup>2</sup>	< 0.01
Combined routes, Systemic effects, Long Term	-	0.063

Combined routes, Systemic effects, Acute	-	< 0.01
<b>Contributing scenario controlling wo</b> PROC10 Brushing, roller, spreader, flor	• • • • •	
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 <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.78
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling wo PROC13 Treatment of articles by dippi		
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/m <sup>3</sup>	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m <sup>3</sup>	< 0.01
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.2 mg/cm <sup>2</sup>	0.2
Combined routes, Systemic effects, Long Term	-	0.704
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling wo PROC2 Curing and drying processes a		20

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/m <sup>3</sup>	< 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 <sup>2</sup>	0.02
Combined routes, Systemic effects, Long Term	-	0.07
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling we PROC8a Manual cleaning and mainter	• • • • •	
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 <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic	_	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 scena	rio	
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 ERC5 Industrial use of Metal Treatm	• • • • •	
Amounts used, Frequency and du	ration 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	$\geq 2 \times 10^3 \text{ m}^3/\text{days}$	
Application of the STP sludge on agricultural soil	Yes	
Conditions and measures related	to external treatment of waste for disposal	
	te treatment operations: No (low risk) (ERC based assessment demonstrating control sk assumed for waste life stage. Waste disposal according to national/local legislation	
Other given operational condition	s affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10 <sup>4</sup> m <sup>3</sup> /days	
Chemical waste - discontinuous generation	Spent process fluid to be disposed of as chemical waste	
Chemical waste - continuous generation	Spent fluid discharged to wastewater 204/	

On site treatment of wastewater	pH adjustment and subsequent filtration/sedimentation - Ni salts [Effectiveness - Water: 95%]	
Contributing scenario controlling PROC2 Application of metal surface	worker exposure (1) e 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 du	Iration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measur	es 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 condition	s affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands face (480 cm <sup>2</sup> )	
Contributing scenario controlling PROC8a Batch loading of equipmer	• • • • •	
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	>25%	
Solid in solid mixtures	Yes	
Amounts used, Frequency and du	iration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measur	es to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)	
Containment	No. 205	
Concentration of substance in mixture Solid in solid mixtures Amounts used, Frequency and du Duration of activity Technical conditions and measure General ventilation	>25%         Yes         uration of use         <8 hour(s)	

	No. [Effectiveness_Inhelation: 0%]		
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 condition	is affecting workers exposure		
Place of use	Indoor use		
Process temperature (for solid)	Ambient		
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )		
Contributing scenario controlling PROC8b Raw material receipt and the second statement of the second s			
Product (article) characteristic			
Dustiness of material	Low		
Concentration of substance in mixture	5-25%		
Solid in solid mixtures	Yes		
Amounts used, Frequency and du	iration of use		
Duration of activity	<8 hour(s)		
Technical conditions and measur	es 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 condition	s affecting workers exposure		
Place of use	Indoor use		
Process temperature (for solid)	Ambient		
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )		

Contributing scenario controlling PROC13 Treatment of articles by d	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and d	uration of use
Duration of activity	<8 hour(s)
Technical conditions and measu	res 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 condition	s affecting workers exposure
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm <sup>2</sup> )
Contributing scenario controlling PROC8a Manual cleaning and main	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and d	uration of use
Duration of activity	<8 hour(s)
Technical conditions and measu	res to control dispersion from source towards the worker
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No. 207

Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]	
Occupational Health and Safety Management System	Advanced	
Conditions and measures related	to personal protection, hygiene and hea	Ith evaluation
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effect	tiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]	
Eye Protection	Safety spectacles/goggles/full face shield	3
Other given operational conditions	s affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Section 3: Exposure estimation an	d reference to its source	
Contributing scenario controlling ERC5 Industrial use of Metal Treatm		
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 <sup>-4</sup> mg/L	0.01
Sewage treatment plant	0.008 mg/L	< 0.01
Man via Environment - Inhalation	2.918 X 10 <sup>-11</sup> mg/m <sup>3</sup>	< 0.01
Man via Environment - Oral	2.246 X 10 <sup>-4</sup> mg/kg bw/day	< 0.01
Contributing scenario controlling PROC2 Application of metal surface	worker exposure (1) treatment in closed systems with occasion	al 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/m <sup>3</sup>	< 0.01
Dermal, Systemic effects, Long Term	0.137 mg/kg bw/day	0.068

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

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/m <sup>3</sup>	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m <sup>3</sup>	< 0.01
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.2 mg/cm <sup>2</sup>	0.2
Combined routes, Systemic effects, Long Term	-	0.704
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling w PROC8a Manual cleaning and mainte		
PROC8a Manual cleaning and mainte		
PROC8a Manual cleaning and mainter Method: TRA Worker v3 Route of exposure and type of		Risk characterisation ratio
	nance of equipment	Risk characterisation ratio
PROC8a Manual cleaning and mainter Method: TRA Worker v3 Route of exposure and type of effects nhalation, Systemic effects, .ong Term	nance of equipment Exposure concentration	
PROC8a Manual cleaning and mainter Method: TRA Worker v3 Route of exposure and type of effects Inhalation, Systemic effects,	nance of equipment Exposure concentration 0.5 mg/m <sup>3</sup>	0.094
PROC8a Manual cleaning and mainter         Method: TRA Worker v3         Route of exposure and type of effects         Inhalation, Systemic effects, Long Term         Inhalation, Systemic effects, Acute         Inhalation, Local effects, Long Term	Exposure concentration 0.5 mg/m <sup>3</sup> 2 mg/m <sup>3</sup>	0.094
PROC8a Manual cleaning and mainter         Method: TRA Worker v3         Route of exposure and type of effects         Inhalation, Systemic effects, Long Term         Inhalation, Systemic effects, Acute         Inhalation, Local effects,	Exposure concentration 0.5 mg/m³ 2 mg/m³ 0.5 mg/m³	0.094 0.019 0.016
PROC8a Manual cleaning and mainter         Method: TRA Worker v3         Route of exposure and type of effects         Inhalation, Systemic effects, Long Term         Inhalation, Systemic effects, Acute         Inhalation, Local effects, Acute         Inhalation, Local effects, Acute         Inhalation, Local effects, Acute         Inhalation, Systemic effects, Long Term         Inhalation, Local effects, Acute         Inhalation, Local effects, Acute         Inhalation, Systemic effects, Acute	Exposure concentration         0.5 mg/m³         2 mg/m³         0.5 mg/m³         2 mg/m³	0.094 0.019 0.016 0.019
PROC8a Manual cleaning and mainter         Method: TRA Worker v3         Route of exposure and type of effects         Inhalation, Systemic effects, Long Term         Inhalation, Systemic effects, Acute         Inhalation, Local effects, Acute         Inhalation, Local effects, Acute         Dermal, Systemic effects,	Exposure concentration         0.5 mg/m³         2 mg/m³         0.5 mg/m³         1.371 mg/kg bw/day	0.094 0.019 0.016 0.019 0.686

#### 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.

## 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 ERC8f, ERC8c Use leading to inclusion into/onto matrix environmental exposure PROC8a Transfer in non-dedicated facilities Contributing scenario controlling worker exposure PROC10 Roller application or brushing PROC11 Non industrial spraying ES 25 Service life (professional worker); Service life articles used by workers; SU Subsequent service life exposure 5; SU 6b; SU 11; SU 12; SU 13; SU 16; SU 17; SU 18; SU 19; SU 0 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) ERC8f Use leading to inclusion into/onto matrix Amounts used, Frequency and duration of use $\leq 5.5 \times 10^{-6}$ tonnes/day Daily wide dispersive use Percentage of tonnage used at 10% regional scale Conditions and measures related to municipal sewage treatment plant Municipal STP Yes. [Effectiveness - Water: 87.34%] Discharge rate of STP $\geq$ 2 X 10<sup>3</sup> m<sup>3</sup>/days Application of the STP sludge on Yes agricultural soil 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

## Exposure Scenario 22: Professional painting and coatings

Receiving surface water flow  $\geq 1.8 \times 10^4 \text{ m}^3/\text{days}$ 

Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	5-25%	
Solid in solid mixtures	Yes	
Amounts used, Frequency and d	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measu	res 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	l 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 condition	ns affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Contributing scenario controlling PROC10 Roller application or brush		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	5-25%	
Solid in solid mixtures	Yes	
Amounts used, Frequency and d	uration of use	
Duration of activity	<4 hour(s)	
Technical conditions and measu	res 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%]	212

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 condition	s affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Contributing scenario controlling PROC11 Non industrial spraying	worker exposure (3)	
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	5-25%	
Solid in solid mixtures	Yes	
Amounts used, Frequency and du	ration of use	
Duration of activity	<1 hour(s)	
Technical conditions and measure	es 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 condition	s affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands and upper wrists (1500 cm <sup>2</sup> )	
Section 3: Exposure estimation a	nd reference to its source	
Contributing scenario controlling ERC8f Use leading to inclusion into/		

Release route	Release rate	Release estimation method
Water	5.5 X 10 <sup>-4</sup> kg/day	ERC based
Air	0.008 kg/day	ERC based
Soil	2.75 X 10 <sup>-4</sup> kg/day	ERC based
Protection target	Exposure estimation	Risk characterisation ratio
Fresh water	2.675 X 10 <sup>-4</sup> mg/L	< 0.01
Sea water	2.556 X 10 <sup>-5</sup> mg/L	< 0.01
Sewage treatment plant	3.481 X 10⁻⁵ mg/L	< 0.01
Man via Environment - Inhalation	2.912 X 10 <sup>-11</sup> mg/m <sup>3</sup>	< 0.01
Man via Environment - Oral	7.286 X 10⁻⁵ mg/kg bw/day	< 0.01
Contributing scenario controlling w PROC8a Transfer in non-dedicated fa Method: TRA Worker v3	• • • •	
Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Inhalation, Systemic effects, Long Term	0.3 mg/m <sup>3</sup>	0.056
Inhalation, Systemic effects, Acute	1.2 mg/m <sup>3</sup>	0.012
Inhalation, Local effects, Long Term	0.3 mg/m³	< 0.01
Inhalation, Local effects, Acute	1.2 mg/m <sup>3</sup>	0.012
Dermal, Systemic effects, Long Term	0.823 mg/kg bw/day	0.411
Dermal, Local effects, Long Term	0.06 mg/cm <sup>2</sup>	0.06
Combined routes, Systemic effects, Long Term	-	0.468
Combined routes, Systemic effects, Acute	-	0.012
Contributing scenario controlling w PROC10 Roller application or brushin	• • • • •	
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 <sup>2</sup>	0.072
Combined routes, Systemic effects, Long Term	-	0.528
Combined routes, Systemic effects, Acute	-	0.012
Contributing scenario controlling w PROC11 Non industrial spraying	rorker exposure (3)	•
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/m <sup>3</sup>	0.023
Dermal, Systemic effects, Long Term	1.286 mg/kg bw/day	0.643
Dermal, Local effects, Long Term	0.06 mg/cm <sup>2</sup>	0.06
Combined routes, Systemic effects, Long Term	-	0.665
Combined routes, Systemic effects, Acute	-	0.023
Section 4: Guidance to DU to evalu	ate whether he works inside the bound	daries set by the ES
No additional risk management measu workers.	ures, besides those that are mentioned a	bove, are needed to guarantee safe use for

# Exposure Scenario 23: Consumer painting and coatings

Section 1: Title of exposure scena	ario	
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 ERC8f Use leading to inclusion into		
Amounts used, Frequency and du	uration of use	
Daily wide dispersive use	≤ 2.75 X 10 <sup>-5</sup> 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 <sup>3</sup> m³/days	
Application of the STP sludge on agricultural soil	Yes	
Conditions and measures related	to external treatment of waste for disposal	
	ste treatment operations: No (low risk) (ERC based assessment demonstrating control isk assumed for waste life stage. Waste disposal according to national/local legislation	
Other given operational condition	affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10 <sup>4</sup> m <sup>3</sup> /days	
Contributing scenario controlling PC9a Use in water born wall paints,		
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. 216/2	

Amounts used, Frequency and d	uration of use		
Amount of product used per application	1.3 X 10 <sup>3</sup> g/event		
Exposure time	2.2 hour(s)		
Frequency of use	1 event/day		
Other conditions affecting consu	mers exposure		
Body parts potentially exposed	Inside hands / one hand / palm of hand	s	
Dermal transfer factor	1		
Contributing scenario controlling PC9a Use in rich solvent paints, rol			
Product (article) characteristic			
Product/ Article subcategory	Solvent rich, high solid, water borne pa	int	
Spray	No.		
Concentration of substance in mixture	0.05 g/g		
Oral contact foreseen	No.		
Amounts used, Frequency and d	uration of use		
Amount of product used per application	1 X 10 <sup>3</sup> g/event		
Exposure time	2.2 hour(s)		
Frequency of use	1 event/day		
Other conditions affecting consu	mers exposure		
Body parts potentially exposed	Inside hands / one hand / palm of hand	S	
Dermal transfer factor	1		
Contributing scenario controlling PC14 Metal surface treatments (ge			
Product (article) characteristic			
Product/ Article subcategory	No value		
Contributing scenario controlling PC38 Welding and Flux products	g consumer exposure (4)		
Product (article) characteristic			
Product/ Article subcategory	No value		
Section 3: Exposure estimation a	ind reference to its source		
Contributing scenario controlling ERC8f Use leading to inclusion into			
Release route	Release rate	Release estimation method	
Water	2.75 X 10 <sup>-4</sup> kg/day	ERC based	
Air	0.004 kg/day	ERC based	
Soil	1.375 X 10 <sup>-4</sup> kg/day	ERC based	217/

Protection target	Exposure estimation	Risk characterisation ratio
Fresh water	2.657 X 10 <sup>-4</sup> mg/L	<0.01
Sea water	2.538 X 10 <sup>-5</sup> mg/L	<0.01
Sewage treatment plant	1.74 X 10 <sup>-5</sup> mg/L	<0.01
Man via Environment - Inhalation	2.912 X 10 <sup>-11</sup> mg/m <sup>3</sup>	<0.01
Man via Environment - Oral	7.285 X 10 <sup>-5</sup> mg/kg bw/day	<0.01
Contributing scenario controlling control ling control ling control ling control ling control ling control ling		
Method: TRA Consumer v3		
Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Inhalation, Systemic effects, Long Term	0.022 mg/m <sup>3</sup>	0.014
Inhalation, Local effects, Long Term	0.022 mg/m <sup>3</sup>	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 controlling controlling controlling control be in rich solvent paints, roller		
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 co		
Not available		

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 scena	rio
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 ERC5 General industrial use in produ	
Amounts used, Frequency and du	ration 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	$\geq$ 2 X 10 <sup>3</sup> m <sup>3</sup> /days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related	to external treatment of waste for disposal
	te treatment operations: No (low risk) (ERC based assessment demonstrating control sk assumed for waste life stage. Waste disposal according to national/local legislation

Other given operational conditions affecting environmental exposure

Receiving surface water flow	≥ 1.8 X 10 <sup>4</sup> m <sup>3</sup> /days	
Contributing scenario controlling PROC8b Raw material receipt and t	• • • • • • • • • • • • • • • • • • • •	
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and du	iration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measur	es 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 condition	s affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
<b>Contributing scenario controlling</b> PROC5 Preparation of polymers an	• • • • •	
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and du	iration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measur	es 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	220/

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 condition	ns affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands face (480 cm <sup>2</sup> )	
Contributing scenario controlling PROC14 Polymer compounding	worker exposure (3)	
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and de	uration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measur	es 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 condition	s affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands face (480 cm <sup>2</sup> )	
Contributing scenario controlling PROC24 Polymer compounding (hi		
Product (article) characteristic		
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and d	uration of use	
		-22

Duration of activity	<8 hour(s)
Technical conditions and measure	es 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 condition	s 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 <sup>2</sup> )
Contributing scenario controlling PROC8a Batch loading of equipmen	• • • • • •
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and du	iration of use
Duration of activity	<8 hour(s)
Technical conditions and measure	es 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 condition	s affecting workers exposure
Place of use	Indoor use
	22

Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Contributing scenario controlling PROC8a Manual cleaning and main		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and du	iration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measur	es to control dispersion from source to	vards the worker
General ventilation	Basic general ventilation (1-3 air change	es 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 hea	Ith evaluation
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effect	tiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]	
Eye Protection	Safety spectacles/goggles/full face shield	
Other given operational condition	s affecting workers exposure	
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )	
Section 3: Exposure estimation a	nd reference to its source	
Contributing scenario controlling ERC5 General industrial use in proc		
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 <sup>-4</sup> mg/m <sup>3</sup>	< 0.01 223

Man via Environment - Oral	0.018 mg/kg bw/day	< 0.01
Contributing scenario controlling wo PROC8b Raw material receipt and tran		
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/m <sup>3</sup>	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m <sup>3</sup>	< 0.01
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.704
Combined routes, Systemic effects, Acute	-	< 0.01
<b>Contributing scenario controlling wo</b> PROC5 Preparation of polymers and re		
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/m <sup>3</sup>	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 <sup>2</sup>	0.2
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling wo PROC14 Polymer compounding	orker exposure (3)	
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/m <sup>3</sup>	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m <sup>3</sup>	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m <sup>3</sup>	< 0.01
Dermal, Systemic effects, Long Term	0.343 mg/kg bw/day	0.172
Dermal, Local effects, Long Term	0.05 mg/cm <sup>2</sup>	0.05
Combined routes, Systemic effects, Long Term	-	0.19
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling w PROC24 Polymer compounding (high		
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 <sup>2</sup>	0.01
Combined routes, Systemic effects, Long Term	-	0.517
Combined routes, Systemic effects, Acute	-	0.077
Contributing scenario controlling w PROC8a Batch loading of equipment		
Method: TRA Worker v3		
Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
	0.5 mg/m³	0.094
Inhalation, Systemic effects, Long Term		

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 <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling w PROC8a Manual cleaning and mainte	• • • • •	
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/m <sup>3</sup>	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 <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Section 4: Guidance to DU to evaluate	ate whether he works inside the bound	laries set by the ES
No additional risk management measu workers.	ures, besides those that are mentioned al	bove, are needed to guarantee safe use for

Section 1: Title of exposure scena	irio	
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	s)
Contributing scenario controlling environmental exposure	ERC8f, ERC8c Professional use of resins	
Contributing scenario controlling	PROC8a Transfer in non-dedicated facilities	226

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 ERC8f Professional use of resins	environmental exposure (1)
Amounts used, Frequency and du	ration of use
Daily wide dispersive use	$\leq$ 5.5 X 10 <sup>-5</sup> 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 <sup>3</sup> m <sup>3</sup> /days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related	to external treatment of waste for disposal
	te treatment operations: No (low risk) (ERC based assessment demonstrating control sk assumed for waste life stage. Waste disposal according to national/local legislation
Other given operational condition	s affecting environmental exposure
Receiving surface water flow	≥ 1.8 X 10 <sup>4</sup> m³/days
Contributing scenario controlling PROC8a Transfer in non-dedicated	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and du	ration of use
Duration of activity	<8 hour(s)
Technical conditions and measure	es 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 227

	1
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 condition	is affecting workers exposure
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )
Contributing scenario controlling PROC5 Mixing (general)	worker exposure (2)
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and du	Luration of use
Duration of activity	<8 hour(s)
Technical conditions and measur	es 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 condition	is affecting workers exposure
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm <sup>2</sup> )
Contributing scenario controlling PROC11 Non industrial spraying	worker exposure (3)
Product (article) characteristic	
Dustiness of material	Low 22

Concentration of substance in mixture	5-25%
Solid in solid mixtures	Yes
Amounts used, Frequency and de	uration of use
Duration of activity	<1 hour(s)
Technical conditions and measur	es 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 condition	s affecting workers exposure
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands and upper wrists (1500 cm <sup>2</sup> )
Contributing scenario controlling PROC10 Roller application or brush	• • • • • •
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	5-25%
Solid in solid mixtures	Yes
Amounts used, Frequency and d	uration of use
Duration of activity	<4 hour(s)
Technical conditions and measur	es 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%]
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Respiratory protection	No. [Effectiveness - Inhalation: 0%]		
Eye Protection	Safety spectacles/goggles/full face shield		
Other given operational condition	s affecting workers exposure		
Place of use	Indoor use		
Process temperature (for solid)	Ambient		
Skin surface potentially exposed	Two hands (960 cm <sup>2</sup> )		
Section 3: Exposure estimation an	d reference to its source		
Contributing scenario controlling ERC8f Professional use of resins	environmental exposure (1)		
Release route	Release rate	Release estimation method	
Water	5.5 X 10 <sup>-4</sup> kg/day	ERC based	
Air	0.008 kg/day	ERC based	
Soil	2.75 X 10 <sup>-4</sup> kg/day	ERC based	
Protection target	Exposure estimation	Risk characterisation ratio	
Fresh water	2.675 X 10 <sup>-4</sup> mg/L	< 0.01	
Sea water	2.556 X 10 <sup>-5</sup> mg/L	< 0.01	
Sewage treatment plant	3.481 X 10 <sup>-5</sup> mg/L	< 0.01	
Man via Environment - Inhalation	2.912 X 10 <sup>-11</sup> mg/m <sup>3</sup>	< 0.01	
Man via Environment - Oral	7.286 X 10 <sup>-5</sup> mg/kg bw/day	< 0.01	
Contributing scenario controlling PROC8a Transfer in non-dedicated f			
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 <sup>2</sup>	0.1	
Combined routes, Systemic effects, Long Term	-	0.779	
Combined routes, Systemic effects, Acute	-	0.019	

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

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 <sup>2</sup>	0.072
Combined routes, Systemic effects, Long Term	-	0.528
Combined routes, Systemic effects, Acute	-	0.012
Section 4: Guidance to DU to evalu	ate whether he works inside the boun	daries set by the ES
No additional risk management meas workers.	ures, besides those that are mentioned a	bove, are needed to guarantee safe use for

# Exposure Scenario 26: Consumer resin use

Section 1: Title of exposure scena	rio
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 ERC8f Consumer resin use	environmental exposure (1)
Amounts used, Frequency and du	ration of use
Daily wide dispersive use	≤ 2.75 X 10 <sup>-5</sup> 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	$\geq$ 2 X 10 <sup>3</sup> m <sup>3</sup> /days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related	to external treatment of waste for disposal 232

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.)

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Other given operational conditions	s affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10 <sup>4</sup> m³/days	
Contributing scenario controlling PC32 Use of resins	consumer exposure (1)	
Product (article) characteristic		
Product/ Article subcategory	No value	
Contributing scenario controlling PC1 Adhesives, sealants	consumer exposure (2)	
Product (article) characteristic		
Product/ Article subcategory	Glues DIY-use (carpet glue, tile glue, wo	ood parquet glue)
Concentration of substance in mixture	0.05 g/g	
Oral contact foreseen	No.	
Amounts used, Frequency and du	ration 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 consun	ners exposure	
Body parts potentially exposed	Inside hands / one hand / palm of hands	S
Dermal transfer factor	1	
Section 3: Exposure estimation an	d reference to its source	
Contributing scenario controlling ERC8f Consumer resin use	environmental exposure (1)	
Release route	Release rate	Release estimation method
Water	2.75 X 10 <sup>-4</sup> kg/day	ERC based
Air	0.004 kg/day	ERC based
Soil	1.375 X 10 <sup>-4</sup> kg/day	ERC based
Protection target	Exposure estimation	Risk characterisation ratio
Fresh water	2.657 X 10 <sup>-4</sup> mg/L	<0.01
Sea water	2.538 X 10⁻⁵ mg/L	<0.01
Sewage treatment plant	1.74 X 10 <sup>-5</sup> mg/L	<0.01
Man via Environment - Inhalation	2.912 X 10 <sup>-11</sup> mg/m <sup>3</sup>	<0.01

Not available		
Contributing scenario controlling co PC1 Adhesives, sealants	onsumer exposure (1)	
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

# Exposure Scenario 27: Laboratory use (professional worker)

workers.

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	

Amounts used, Frequency and dur	ation of use
Daily wide dispersive use	≤ 5.5 X 10 <sup>-7</sup> tonnes/day
Percentage of tonnage used at regional scale	10%
Conditions and measures related to	o municipal sewage treatment plant
Municipal STP	Yes. [Effectiveness - Water: 87.34%]
Discharge rate of STP	≥ 2 X 10 <sup>3</sup> m <sup>3</sup> /days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related to	o external treatment of waste for disposal
	e treatment operations: No (low risk) (ERC based assessment demonstrating control k assumed for waste life stage. Waste disposal according to national/local legislation
Other given operational conditions	affecting environmental exposure
Receiving surface water flow	≥ 1.8 X 10 <sup>4</sup> m³/days
Contributing scenario controlling v PROC4 Use in batch and other proce	vorker exposure (1) ss (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 dur	ation of use
Duration of activity	<8 hour(s)
Technical conditions and measure	s 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	o 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	
Place of use	Indoor use

Skin surface potentially exposed	Two hands face (480 cm²)	
Contributing scenario controlling v PROC2 Use in closed, continuous pr	worker exposure (2) ocess with occasional controlled exposure	
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and du	ration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measure	s 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 t	o 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 <sup>2</sup> )	
Contributing scenario controlling PROC9 Transfer of substance or pre		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and du	ration of use	
Duration of activity	<8 hour(s)	
Technical conditions and measure	s 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	236

Conditions and measures related to	o 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 <sup>2</sup> )	
Contributing scenario controlling v PROC15 Use as laboratory reagent	vorker exposure (4)	
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and dur	ation of use	
Duration of activity	<8 hour(s)	
Technical conditions and measure	s 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	o 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 <sup>2</sup> )	
Contributing scenario controlling v PROC8a Maintenance and cleaning of		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	

Amounts used, Frequency and du	uration of use		
Duration of activity	<8 hour(s)		
Technical conditions and measur	es to control dispersion from source tov	vards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)		
Containment	No.	No.	
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]		
Occupational Health and Safety Management System	Basic		
Conditions and measures related	to personal protection, hygiene and hea	Ith evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effec	tiveness - Dermal: 90%]	
Respiratory protection	No. [Effectiveness - Inhalation: 0%]		
Eye Protection	Safety spectacles/goggles/full face shield	d	
Other given operational condition	s affecting workers exposure		
Place of use	Indoor use		
Process temperature (for solid)	Ambient		
Skin surface potentially exposed	Two hands (960 cm²)		
Section 3: Exposure estimation a	nd reference to its source		
Contributing scenario controlling ERC8e Laboratory use (professiona			
Release route	Release rate	Release estimation method	
Water	1.1 X 10 <sup>-5</sup> kg/day	ERC based	
Air	5.5 X 10 <sup>-7</sup> kg/day	ERC based	
Soil	5.5 X 10 <sup>-6</sup> kg/day	ERC based	
Protection target	Exposure estimation	Risk characterisation ratio	
Fresh water	2.641 X 10 <sup>-4</sup> mg/L	<0.01	
Sea water	2.522 X 10 <sup>-5</sup> mg/L	<0.01	
Sewage treatment plant	6.961 X 10 <sup>-7</sup> mg/L	<0.01	
Man via Environment - Inhalation	2.912 X 10 <sup>-11</sup> mg/m <sup>3</sup>	<0.01	
Man via Environment - Oral	7.285 X 10 <sup>-5</sup> mg/kg bw/day <0.01		
Contributing scenario controlling PROC4 Use in batch and other proc	worker exposure (1) cess (synthesis) where opportunity for expo	sure 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 <sup>3</sup>	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 <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.531
Combined routes, Systemic effects, Acute	-	0.038
Contributing scenario controlling v PROC2 Use in closed, continuous pr	worker exposure (2) ocess with occasional controlled exposure	9
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/m <sup>3</sup>	< 0.01
Inhalation, Local effects, Long Term	0.01 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.04 mg/m <sup>3</sup>	< 0.01
Dermal, Systemic effects, Long Term	0.137 mg/kg bw/day	0.068
Dermal, Local effects, Long Term	0.02 mg/cm <sup>2</sup>	0.02
Combined routes, Systemic effects, Long Term	-	0.07
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling v PROC9 Transfer of substance or pre		
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
	2 mg/m <sup>3</sup>	0.019
Inhalation, Local effects, Acute	2 119/11	0.010

Long Term		
Dermal, Local effects, Long Term	0.1 mg/cm <sup>2</sup>	0.1
Combined routes, Systemic effects, Long Term	-	0.437
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling w PROC15 Use as laboratory reagent	rorker exposure (4)	
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/m <sup>3</sup>	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m <sup>3</sup>	< 0.01
Dermal, Systemic effects, Long Term	0.034 mg/kg bw/day	0.017
Dermal, Local effects, Long Term	0.01 mg/cm <sup>2</sup>	< 0.01
Combined routes, Systemic effects, Long Term	-	0.036
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling w PROC8a Maintenance and cleaning o		
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/m <sup>3</sup>	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m <sup>3</sup>	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm <sup>2</sup>	0.1
Combined routes, Systemic	-	0.779
effects, Long Term		

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 scen	ario
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	<ul> <li>ES6: Consumer Use - Consumer water treatment and cleaning product use</li> <li>ES11: Use at industrial site - Use at industrial sites of dyestuffs and in textiles uses</li> <li>ES13: Use at industrial site - Use at industrial sites in construction products</li> <li>ES14: Use by professional worker - Professional creation of building materials and articles</li> <li>ES15: Consumer Use - Consumer building product use</li> <li>ES17: Use at industrial site - General Industrial use of coatings and inks</li> <li>ES19: Use by professional worker - Professional painting and coatings</li> <li>ES20: Consumer Use - Consumer painting and coatings</li> <li>ES21: Use at industrial site - General industrial use in production of polymers and resins</li> <li>ES22: Use by professional worker - Professional use of resins</li> <li>ES23: Consumer Use - Consumer resin use</li> </ul>
Section 2: Operational condition	s of use
Contributing scenario controlling ERC10a Use in articles	g environmental exposure (1)

Daily wide dispersive use	$\leq$ 5.5 X 10 <sup>-4</sup> 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 <sup>3</sup> m <sup>3</sup> /days	
Application of the STP sludge on agricultural soil	Yes	
Conditions and measures related	to external treatment of waste for dispos	sal
	ste treatment operations: No (low risk) (ERC isk assumed for waste life stage. Waste dis	
Other given operational condition	s affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10 <sup>4</sup> m <sup>3</sup> /days	
Section 3: Exposure estimation a	nd reference to its source	
Contributing scenario controlling ERC10a Use in articles	environmental exposure (1)	
Release route	Release rate	Release estimation method
Water	0.018 kg/day	ERC based
Air	2.75 X 10 <sup>-4</sup> kg/day	ERC based
Soil	0.018 kg/day	ERC based
Protection target	Exposure estimation	Risk characterisation ratio
Fresh water	3.754 X 10 <sup>-4</sup> mg/L	<0.01
Sea water	3.635 X 10⁻⁵ mg/L	<0.01
Sewage treatment plant	0.001 mg/L <0.01	
	2.912 X 10 <sup>-11</sup> mg/m <sup>3</sup> <0.01	
Man via Environment - Inhalation		
Man via Environment - Inhalation Man via Environment - Oral	7.33 X 10 <sup>-5</sup> mg/kg bw/day	<0.01

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	<ul> <li>ES6: Consumer Use - Consumer water treatment and cleaning product use</li> <li>ES9: Consumer Use - Consumer cosmetics, pharmaceuticals and personal care products</li> <li>ES11: Use at industrial site - Use at industrial sites of dyestuffs and in textiles uses</li> <li>ES13: Use at industrial site - Use at industrial sites in construction products</li> <li>ES14: Use by professional worker - Professional creation of building materials and articles</li> <li>ES15: Consumer Use - Consumer building product use</li> <li>ES17: Use at industrial site - General Industrial use of coatings and inks</li> <li>ES19: Use by professional worker - Professional painting and coatings</li> <li>ES20: Consumer Use - Consumer painting and coatings</li> <li>ES21: Use at industrial site - General industrial use in production of polymers and resins</li> <li>ES22: Use by professional worker - Professional use of resins</li> <li>ES23: Consumer Use - Consumer resin use</li> </ul>	
Section 2: Operational conditions	of use	
Contributing scenario controlling environmental exposure (1) ERC10a Service life articles used by consumers		
Amounts used, Frequency and du	ration of use	
Daily wide dispersive use	≤ 5.5 X 10 <sup>-4</sup> 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 <sup>3</sup> m <sup>3</sup> /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 <sup>4</sup> m³/days	

Section 3: Exposure estimation and reference to its source         Contributing scenario controlling environmental exposure (1)         ERC10a Use in articles		
Water	0.018 kg/day	ERC based
Air	2.75 X 10 <sup>-4</sup> kg/day	ERC based
Soil	0.018 kg/day	ERC based
Protection target	Exposure estimation	Risk characterisation ratio
Fresh water	3.754 X 10 <sup>-4</sup> mg/L	<0.01
Sea water	3.635 X 10 <sup>-5</sup> mg/L	<0.01
Sewage treatment plant	0.001 mg/L	<0.01
Man via Environment - Inhalation	2.912 X 10 <sup>-11</sup> mg/m <sup>3</sup>	<0.01
Man via Environment - Oral	7.33 X 10 <sup>-5</sup> mg/kg bw/day	<0.01
Section 4: Guidance to DU to evalua	te whether he works inside the bound	daries set by the ES
No additional rick management magazy	rea basides these that are mentioned a	have are needed to guarantee acts use fo

No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.