RHEOBYK-431

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Trade name : RHEOBYK-431

Product code : 000000000000130005

1.2 Relevant identified uses of the substance or mixture and uses advised against

Use of the Substance/Mixture : Rheology Additive

1.3 Details of the supplier of the safety data sheet

Company : BYK-Chemie GmbH
Abelstrasse 45
46483 Wesel
Telephone : +49 281 670-0
Telefax : +49 281 65735

Information : Regulatory Affairs
Telephone : +49 281 670-23532
Telefax : +49 281 670-23533
E-mail address : GHS.BYK@altana.com

1.4 Emergency telephone number

+44 1235 239670

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Flammable liquids, Category 3	H226: Flammable liquid and vapour.
Skin irritation, Category 2	H315: Causes skin irritation.
Serious eye damage, Category 1	H318: Causes serious eye damage.
Specific target organ toxicity - single exposure, Category 3, Central nervous system	H336: May cause drowsiness or dizziness.
Specific target organ toxicity - single exposure, Category 3, Respiratory system	H335: May cause respiratory irritation.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms :

Signal word : Danger

Hazard statements : H226 Flammable liquid and vapour.
H315 Causes skin irritation.
H318 Causes serious eye damage.
H335 May cause respiratory irritation.
H336 May cause drowsiness or dizziness.

Precautionary statements : **Prevention:**

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P261 Avoid breathing mist or vapours.
P264 Wash skin thoroughly after handling.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.

Response:

P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

Hazardous components which must be listed on the label:

- 78-83-1 iso-butanol

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Ecological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Toxicological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Chemical nature : Solution of a high molecular urea modified non polar polyamide

Components

Chemical name	CAS-No. EC-No. Index-No. Registration number	Classification	Concentration (% w/w)
iso-butanol	78-83-1	Flam. Liq. 3; H226	>= 50 - <= 100

	201-148-0 01-2119484609-23	Skin Irrit. 2; H315 Eye Dam. 1; H318 STOT SE 3; H336 (Central nervous system) STOT SE 3; H335 (Respiratory system)	
Polyamide	-	Skin Irrit. 2; H315 Eye Irrit. 2; H319	>= 25 - < 30
2-phenoxyethanol	122-99-6 204-589-7 01-2119488943-21	Acute Tox. 4; H302 Eye Dam. 1; H318 STOT SE 3; H335 (Respiratory system) ——————— Acute toxicity esti-mate Acute oral toxicity: 1.840 mg/kg	>= 7 - < 10

For explanation of abbreviations see section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice : Move out of dangerous area.
Consult a physician.
Show this safety data sheet to the doctor in attendance.
Do not leave the victim unattended.

If inhaled : Consult a physician after significant exposure.
If unconscious, place in recovery position and seek medical advice.

In case of skin contact : If skin irritation persists, call a physician.
If on skin, rinse well with water.
If on clothes, remove clothes.

In case of eye contact : Small amounts splashed into eyes can cause irreversible tissue damage and blindness.
In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Continue rinsing eyes during transport to hospital.
Remove contact lenses.
Protect unharmed eye.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.

If swallowed : Keep respiratory tract clear.
Do NOT induce vomiting.
Do not give milk or alcoholic beverages.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.
Take victim immediately to hospital.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms	:	No information available.
Risks	:	No information available.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment	:	No information available.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media	:	Alcohol-resistant foam Carbon dioxide (CO2) Dry chemical
Unsuitable extinguishing media	:	High volume water jet

5.2 Special hazards arising from the substance or mixture

Specific hazards during fire-fighting	:	Do not allow run-off from fire fighting to enter drains or water courses.
Hazardous combustion products	:	Carbon oxides Nitrogen oxides (NOx) Halogenated compounds Metal oxides Hydrogen chloride

5.3 Advice for firefighters

Special protective equipment for firefighters	:	Wear self-contained breathing apparatus for firefighting if necessary.
Further information	:	Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. For safety reasons in case of fire, cans should be stored separately in closed containments. Use a water spray to cool fully closed containers.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions	:	Use personal protective equipment. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

6.2 Environmental precautions

Environmental precautions	:	Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up	:	Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

6.4 Reference to other sections

For disposal considerations see section 13., For personal protection see section 8.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling	:	Avoid formation of aerosol. Do not breathe vapours/dust. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Take precautionary measures against static discharges. Provide sufficient air exchange and/or exhaust in work rooms. Open drum carefully as content may be under pressure. To avoid spills during handling keep bottle on a metal tray. Dispose of rinse water in accordance with local and national regulations.
Advice on protection against fire and explosion	:	Do not spray on a naked flame or any incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours). Keep away from open flames, hot surfaces and sources of ignition.
Hygiene measures	:	When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers	:	No smoking. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Electrical installations / working materials must comply with the technological safety standards.
Further information on storage stability	:	No decomposition if stored and applied as directed.

7.3 Specific end use(s)

Specific use(s)	:	No data available

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

Components	CAS-No.	Value type (Form of exposure)	Control parameters	Basis
iso-butanol	78-83-1	TWA	50 ppm 154 mg/m3	GB EH40
		STEL	75 ppm 231 mg/m3	GB EH40

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:

Substance name	End Use	Exposure routes	Potential health effects	Value
iso-butanol	Workers	Inhalation	Long-term local effects	310 mg/m3
	Consumers	Ingestion	Long-term systemic effects	25 mg/kg
	Consumers	Inhalation	Long-term local effects	55 mg/m3
2-phenoxyethanol	Workers	Inhalation	Long-term exposure, Systemic effects, Local effects	8,07 mg/m3
	Workers	Skin contact	Long-term exposure, Systemic effects	34,72 mg/kg
	Consumers	Inhalation	Long-term exposure, Short-term exposure, Local effects	2,5 mg/m3
	Consumers	Skin contact	Long-term exposure, Local effects	20,83 mg/kg
	Consumers	Ingestion	Long-term exposure, Short-term exposure, Systemic effects	17,43 mg/kg

Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006:

Substance name	Environmental Compartment	Value
iso-butanol	Fresh water	0,4 mg/l
	Marine water	0,04 mg/l
	Fresh water sediment	1,52 mg/kg
	Marine sediment	0,152 mg/kg
	Soil	0,0699 mg/kg
	Sewage treatment plant	10 mg/l
	Intermittent releases	11 mg/l
2-phenoxyethanol	Fresh water	0,943 mg/l
	Marine water	0,0943 mg/l
	Intermittent releases	3,44 mg/l
	Fresh water sediment	7,2366 mg/kg
	Marine sediment	0,7237 mg/kg
	Soil	1,26 mg/kg
	Sewage treatment plant	24,8 mg/l

8.2 Exposure controls

Personal protective equipment

Eye protection	:	Eye wash bottle with pure water Tightly fitting safety goggles Wear face-shield and protective suit for abnormal processing problems.
Hand protection		
Material	:	Viton
Break through time	:	120 min
Remarks	:	The suitability for a specific workplace should be discussed with the producers of the protective gloves.
Skin and body protection	:	Impervious clothing Choose body protection according to the amount and concentration of the dangerous substance at the work place.
Respiratory protection	:	In the case of vapour formation use a respirator with an approved filter.

Environmental exposure controls

General advice	:	Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	:	liquid
Colour	:	yellow
Odour	:	alcohol-like
Odour Threshold	:	No data available
Melting point/range	:	< 0 °C Method: derived
Initial boiling point	:	106 °C Method: derived
Upper explosion limit / Upper flammability limit	:	7 %(V)
Lower explosion limit / Lower flammability limit	:	0,6 %(V)
Flash point	:	ca. 29 °C Method: 48 (Abel-Pensky)
Auto-ignition temperature	:	> 200 °C Method: DIN 51794
Decomposition temperature	:	No data available
pH	:	5 (20 °C)

Concentration: 1 %
Method: Universal pH-value indicator

Viscosity
Viscosity, dynamic : ca. 100 mPa.s (20 °C)
Method: 11 (NV, 20°C)

Viscosity, kinematic : No data available

Solubility(ies)
Water solubility : immiscible
Solubility in other solvents : No data available

Partition coefficient: n-octanol/water : No data available

Vapour pressure : < 10 hPa (20 °C)
Method: derived

Relative density : No data available

Density : ca. 0,87 g/cm3 (20 °C, 1.013 hPa)
Method: 4 (20°C oscillating U-tube)

Bulk density : Not applicable

Relative vapour density : No data available

9.2 Other information

Flammability (liquids) : Sustains combustion

Evaporation rate : No data available

Surface tension : No data available

SECTION 10: Stability and reactivity

10.1 Reactivity

No decomposition if stored and applied as directed.

10.2 Chemical stability

No decomposition if stored and applied as directed.

10.3 Possibility of hazardous reactions

Hazardous reactions : No decomposition if stored and applied as directed.

Vapours may form explosive mixture with air.

10.4 Conditions to avoid

Conditions to avoid : Heat, flames and sparks.

10.5 Incompatible materials

Materials to avoid : Strong oxidizing agents
Acids

10.6 Hazardous decomposition products

No data available

SECTION 11: Toxicological information

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

Acute toxicity

Product:

Acute oral toxicity : Acute toxicity estimate: > 2.000 mg/kg
Method: Calculation method

Components:

iso-butanol:

Acute oral toxicity : LD50 (Rat, male): > 2.830 mg/kg
Method: OECD Test Guideline 401
GLP: yes

Acute dermal toxicity : LD50 (Rabbit, male): > 2.000 mg/kg
Method: OECD Test Guideline 402
GLP: yes

2-phenoxyethanol:

Acute oral toxicity : LD50 (Rat): 1.840 mg/kg
Method: OECD Test Guideline 401
GLP: no

Acute toxicity estimate: 1.840 mg/kg
Method: Calculation method

Acute inhalation toxicity : LC50 (Rat): > 1 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 412
GLP: yes
Assessment: The substance or mixture has no acute inhalation toxicity

Skin corrosion/irritation

Product:

Remarks : May irritate skin.
May cause skin irritation in susceptible persons.

Components:

iso-butanol:

Species : Rabbit
Result : Skin irritation

2-phenoxyethanol:

Species : Rabbit
Method : OECD Test Guideline 404
Result : No skin irritation

Serious eye damage/eye irritation

Product:

Remarks : May cause irreversible eye damage.

Components:

iso-butanol:

Species : Rabbit
Method : OECD Test Guideline 405
Result : Eye irritation
GLP : yes

2-phenoxyethanol:

Species : Rabbit
Method : OECD Test Guideline 405
Result : Eye irritation

Respiratory or skin sensitisation

Product:

Remarks : No data available

Components:

iso-butanol:

Test Type : Maximisation Test
Exposure routes : Dermal
Species : Guinea pig
Method : OECD Test Guideline 406
Result : Does not cause skin sensitisation.

2-phenoxyethanol:

Species : Guinea pig
Method : OECD Test Guideline 406
Result : Does not cause skin sensitisation.

Germ cell mutagenicity

Product:

Genotoxicity in vitro : Remarks: No data available

Genotoxicity in vivo : Remarks: No data available

Carcinogenicity

Product:

Remarks : No data available

Reproductive toxicity

Product:

Effects on fertility : Remarks: No data available

Effects on foetal development : Remarks: No data available

Components:

2-phenoxyethanol:

Effects on foetal development : Species: Rat
Application Route: Oral
Duration of Single Treatment: 14 d
General Toxicity Maternal: NOAEL: 300 mg/kg body weight
Teratogenicity: NOAEL: 1.000 mg/kg body weight
Method: OECD Test Guideline 414

Species: Rabbit
Application Route: Dermal
Duration of Single Treatment: 14 d
General Toxicity Maternal: NOAEL: 300 mg/kg body weight
Teratogenicity: NOAEL: 600 mg/kg body weight

STOT - single exposure

Product:

Remarks : No data available

STOT - repeated exposure

Product:

Remarks : No data available

Repeated dose toxicity

Product:

Remarks : No data available

Components:

2-phenoxyethanol:

Species : Rat
NOAEL : 700 mg/kg
Application Route : Oral
Method : OECD Test Guideline 408

Species	:	Rat
NOAEL	:	0,0482 mg/l
Application Route	:	Inhalation
Method	:	OECD Test Guideline 412
Target Organs	:	Respiratory organs

Aspiration toxicity

Product:

No data available

Components:

iso-butanol:

No aspiration toxicity classification

11.2 Information on other hazards

Endocrine disrupting properties

Product:

Assessment	:	The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Further information

Product:

Remarks	:	Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting. Concentrations substantially above the TLV value may cause narcotic effects. Solvents may degrease the skin.

SECTION 12: Ecological information

12.1 Toxicity

Product:

Toxicity to fish	:	Remarks: No data available

Components:

iso-butanol:

Toxicity to fish	:	LC50 (Pimephales promelas (fathead minnow)): 1.430 mg/l Exposure time: 96 h
Toxicity to daphnia and other	:	EC50 (Daphnia pulex (Water flea)): 1.100 mg/l

aquatic invertebrates		Exposure time: 48 h Test Type: static test
Toxicity to algae/aquatic plants	:	ErC50 (Pseudokirchneriella subcapitata (green algae)): 1.799 mg/l Exposure time: 72 h Method: OECD Test Guideline 201 GLP: yes
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC: 20 mg/l End point: Reproduction Exposure time: 21 d Species: Daphnia magna (Water flea) Test Type: semi-static test

2-phenoxyethanol:

Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia (water flea)): min. 100 mg/l Exposure time: 48 h Test Type: static test Method: OECD Test Guideline 202
Toxicity to fish (Chronic toxicity)	:	NOEC: 23 mg/l Exposure time: 34 d Method: OECD Test Guideline 210
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC: 9,43 mg/l Exposure time: 21 d Species: Daphnia (water flea) Test Type: semi-static test Method: OECD Test Guideline 211

12.2 Persistence and degradability

Product:

Biodegradability	:	Remarks: No data available

Components:

iso-butanol:

Biodegradability	:	Result: Readily biodegradable. Method: OECD Test Guideline 301D

2-phenoxyethanol:

Biodegradability	:	Biodegradation: > 70 % Exposure time: 28 d Method: OECD Test Guideline 301A

12.3 Bioaccumulative potential

Product:

Bioaccumulation	:	Remarks: No data available

Components:

iso-butanol:

Partition coefficient: n-octanol/water	:	log Pow: 1 Method: OECD Test Guideline 117 GLP: yes

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

Product:

Assessment	:	This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Endocrine disrupting properties

Product:

Assessment	:	The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

12.7 Other adverse effects

Product:

Additional ecological information	:	No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product	:	Do not dispose of waste into sewer. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.
Contaminated packaging	:	Empty remaining contents. Dispose of as unused product. Do not re-use empty containers. Do not burn, or use a cutting torch on, the empty drum.

SECTION 14: Transport information

14.1 UN number or ID number

ADR	:	UN 1212

RID	:	UN 1212
IMDG	:	UN 1212
IATA	:	UN 1212

14.2 UN proper shipping name

ADR	:	ISOBUTANOL, SOLUTION
RID	:	ISOBUTANOL, SOLUTION
IMDG	:	ISOBUTANOL, SOLUTION
IATA	:	Isobutyl alcohol, solution

14.3 Transport hazard class(es)

ADR	:	3
RID	:	3
IMDG	:	3
IATA	:	3

14.4 Packing group

ADR

Packing group	:	III
Classification Code	:	F1
Hazard Identification Number	:	30
Labels	:	3
Tunnel restriction code	:	D/E

RID

Packing group	:	III
Classification Code	:	F1
Hazard Identification Number	:	30
Labels	:	3

IMDG

Packing group	:	III
Labels	:	3
EmS Code	:	F-E, S-D

IATA (Cargo)

Packing instruction (cargo aircraft)	:	366
Packing group	:	III
Labels	:	Flammable Liquids

IATA (Passenger)

Packing instruction (passenger aircraft)	:	355
Packing instruction (LQ)	:	Y344
Packing group	:	III
Labels	:	Flammable Liquids

14.5 Environmental hazards

ADR

Environmentally hazardous	:	no

RID
Environmentally hazardous : no

IMDG
Marine pollutant : no

14.6 Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

14.7 Maritime transport in bulk according to IMO instruments

Not applicable for product as supplied.

SECTION 15: Regulatory information

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

Relevant EU provisions transposed through retained EU law

REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59).	:	This product does not contain substances of very high concern (Regulation (EC) No 1907/2006 (REACH), Article 57).
Fire Hazard Class	:	A II: Flash point 21 °C to 55 °C, at 15 °C not miscible in water

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.	P5c	FLAMMABLE LIQUIDS
Seveso III Directive (2012/18/EU) implemented by Control of Major Accident Hazards Regulations 2015 (COMAH)	P5c	FLAMMABLE LIQUIDS

15.2 Chemical safety assessment

Not applicable

SECTION 16: Other information

Items where relevant changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

Full text of H-Statements

H226	:	Flammable liquid and vapour.
H302	:	Harmful if swallowed.
H315	:	Causes skin irritation.
H318	:	Causes serious eye damage.
H319	:	Causes serious eye irritation.
H335	:	May cause respiratory irritation.
H336	:	May cause drowsiness or dizziness.

Full text of other abbreviations

Acute Tox.	:	Acute toxicity
Eye Dam.	:	Serious eye damage
Eye Irrit.	:	Eye irritation
Flam. Liq.	:	Flammable liquids
Skin Irrit.	:	Skin irritation
STOT SE	:	Specific target organ toxicity - single exposure
GB EH40	:	UK. EH40 WEL - Workplace Exposure Limits
GB EH40 / TWA	:	Long-term exposure limit (8-hour TWA reference period)
GB EH40 / STEL	:	Short-term exposure limit (15-minute reference period)

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - Substance of Very High Concern; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

Further information

Classification of the mixture:		**Classification procedure:**
Flam. Liq. 3	H226	Based on product data or assessment
Skin Irrit. 2	H315	Calculation method
Eye Dam. 1	H318	Calculation method
STOT SE 3	H336	Calculation method
STOT SE 3	H335	Calculation method

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

GB / EN

Annex: Exposure Scenarios

Table of Contents

ES 1: Use as an intermediate; Industrial uses (SU3).

1.1. Title section

Exposure Scenario name	:	Use as an intermediate
Structured Short Title	:	Use as an intermediate; Industrial uses (SU3).

Environment		
CS 1	**Use of intermediate**	ERC6a
Worker		
CS 2	**Use in closed process, no likelihood of exposure**	PROC1
CS 3	**Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions**	PROC2
CS 4	**Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition**	PROC3
CS 5	**Chemical production where opportunity for exposure arises**	PROC4
CS 6	**Transfer of substance or mixture (charging/discharging) at non dedicated-facilities**	PROC8a
CS 7	**Transfer of substance or mixture (charging/discharging) at dedicated facilities**	PROC8b
CS 8	**Transfer of substance or mixture into small containers (dedicated filling line, including weighing)**	PROC9

1.2. Conditions of use affecting exposure

1.2.1. Control of environmental exposure: Use of intermediate (ERC6a)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount per site	:	20124 t
Maximum daily site tonnage	:	61 t
Technical and organisational conditions and measures		

Do not apply industrial sludge to natural soils.		
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP effluent	:	2.000 m3/d

1.2.2. Control of worker exposure: Use in closed process, no likelihood of exposure (PROC1)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Covers indoor and outdoor use.

1.2.3. Control of worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Covers indoor and outdoor use.

1.2.4. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Covers indoor and outdoor use.

1.2.5. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Covers indoor and outdoor use.

1.2.6. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)

Product (article) characteristics
Covers concentrations up to 100 %

Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

1.2.7. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

1.2.8. Control of worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		

Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

1.3. Exposure estimation and reference to its source

1.3.1. Environmental release and exposure: Use of intermediate (ERC6a)

Protection Target	Exposure estimate	RCR
Freshwater	0,079 mg/L	0,197
Freshwater sediment	0,306 mg/kg dry weight	0,197
Marine water	0,00787 mg/L	0,197
Marine sediment	0,031 mg/kg dry weight	0,196
Agricultural soil	0,000888 mg/kg dry weight	0,012
Sewage treatment plant	0,763 mg/L	0,076

1.3.2. Worker exposure: Use in closed process, no likelihood of exposure (PROC1)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		0,031 mg/m³	< 0,01
inhalative	systemic		0,031 mg/m³	< 0,01

1.3.3. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		15,44 mg/m³	0,05
inhalative	systemic		15,44 mg/m³	0,05

1.3.4. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		30,88 mg/m³	0,1
inhalative	systemic		30,88 mg/m³	0,1

1.3.5. Worker exposure: Chemical production where opportunity for exposure arises (PROC4)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		61,77 mg/m³	0,199
inhalative	systemic		61,77 mg/m³	0,199

1.3.6. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		15,44 mg/m³	0,05
inhalative	systemic		15,44 mg/m³	0,05

1.3.7. Worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		3,861 mg/m³	0,012
inhalative	systemic		3,861 mg/m³	0,012

1.3.8. Worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		15,44 mg/m³	0,05
inhalative	systemic		15,44 mg/m³	0,05

1.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Data refer to lead substance.

ES 2: Formulation & (re)packing of substances and mixtures; Industrial uses (SU3).

2.1. Title section

Exposure Scenario name	:	Formulation & (re)packing of substances and mixtures
Structured Short Title	:	Formulation & (re)packing of substances and mixtures; Industrial uses (SU3).

Environment		
CS 1	**Formulation into mixture**	ERC2
Worker		
CS 2	**Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions**	PROC1
CS 3	**Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions**	PROC2
CS 4	**Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition**	PROC3
CS 5	**Chemical production where opportunity for exposure arises**	PROC4
CS 6	**Mixing or blending in batch processes**	PROC5
CS 7	**Transfer of substance or mixture (charging/discharging) at non dedicated-facilities**	PROC8a
CS 8	**Transfer of substance or mixture (charging/discharging) at dedicated facilities**	PROC8b
CS 9	**Transfer of substance or mixture into small containers (dedicated filling line, including weighing)**	PROC9
CS 10	**Use in closed process, no likelihood of exposure**	PROC1

2.2. Conditions of use affecting exposure

2.2.1. Control of environmental exposure: Formulation into mixture (ERC2)

Product (article) characteristics
Covers percentage substance in the product up to 100 %.
Physical form of product : Liquid
Amount used (or contained in articles), frequency and duration of use/exposure

Annual amount per site	:	10915 t
Maximum daily site tonnage	:	36,4 t
Technical and organisational conditions and measures		
Do not apply industrial sludge to natural soils.		
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP effluent	:	2.000 m3/d

2.2.2. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Covers indoor and outdoor use.

2.2.3. Control of worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		

Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Other conditions affecting workers exposure
Indoor or outdoor use : Covers indoor and outdoor use.

2.2.4. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

Product (article) characteristics
Covers concentrations up to 100 %
Physical form of product : Liquid
Amount used (or contained in articles), frequency and duration of use/exposure
Use frequency : Covers exposure up to 480 min/day
Technical and organisational conditions and measures
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Other conditions affecting workers exposure
Indoor or outdoor use : Covers indoor and outdoor use.

2.2.5. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4)

Product (article) characteristics
Covers concentrations up to 100 %
Physical form of product : Liquid
Amount used (or contained in articles), frequency and duration of use/exposure
Use frequency : Covers exposure up to 480 min/day
Technical and organisational conditions and measures
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Other conditions affecting workers exposure
Indoor or outdoor use : Covers indoor and outdoor use.

2.2.6. Control of worker exposure: Mixing or blending in batch processes (PROC5)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

2.2.7. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

2.2.8. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)

Product (article) characteristics

Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 95 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

2.2.9. Control of worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

2.2.10. Control of worker exposure: Use in closed process, no likelihood of exposure (PROC1)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		

Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Covers indoor and outdoor use.

2.3. Exposure estimation and reference to its source

2.3.1. Environmental release and exposure: Formulation into mixture (ERC2)

Protection Target	Exposure estimate	RCR
Freshwater	0,048 mg/L	0,12
Freshwater sediment	0,176 mg/kg dry weight	0,12
Marine water	0,0048 mg/L	0,12
Marine sediment	0,019 mg/kg dry weight	0,12
Agricultural soil	0,00867 mg/kg dry weight	0,113
Sewage treatment plant	0,455 mg/L	0,046

2.3.2. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		0,031 mg/m³	< 0,01
inhalative	systemic		0,031 mg/m³	< 0,01

2.3.3. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		15,44 mg/m³	0,05
inhalative	systemic		15,44 mg/m³	0,05

2.3.4. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		30,88 mg/m³	0,1
inhalative	systemic		30,88 mg/m³	0,1

2.3.5. Worker exposure: Chemical production where opportunity for exposure arises (PROC4)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		61,77 mg/m³	0,199
inhalative	systemic		61,77 mg/m³	0,199

2.3.6. Worker exposure: Mixing or blending in batch processes (PROC5)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		15,44 mg/m³	0,05
inhalative	systemic		15,44 mg/m³	0,05

2.3.7. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		15,44 mg/m³	0,05
inhalative	systemic		15,44 mg/m³	0,05

2.3.8. Worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		3,861 mg/m³	0,012
inhalative	systemic		3,861 mg/m³	0,012

2.3.9. Worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		15,44 mg/m³	0,05
inhalative	systemic		15,44 mg/m³	0,05

2.3.10. Worker exposure: Use in closed process, no likelihood of exposure (PROC1)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		30,88 mg/m³	0,1
inhalative	systemic		30,88 mg/m³	0,1

2.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Data refer to lead substance.

ES 3: Distribution of substance; Industrial uses (SU3).

3.1. Title section

Exposure Scenario name	:	Distribution of substance
Structured Short Title	:	Distribution of substance; Industrial uses (SU3).

Environment		
CS 1	**Formulation into mixture**	ERC2
Worker		
CS 2	**Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions**	PROC1
CS 3	**Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions**	PROC2
CS 4	**Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition**	PROC3
CS 5	**Chemical production where opportunity for exposure arises**	PROC4
CS 6	**Transfer of substance or mixture (charging/discharging) at non dedicated-facilities**	PROC8a
CS 7	**Transfer of substance or mixture (charging/discharging) at dedicated facilities**	PROC8b
CS 8	**Transfer of substance or mixture into small containers (dedicated filling line, including weighing)**	PROC9
CS 9	**Use as laboratory reagent**	PROC15

3.2. Conditions of use affecting exposure

3.2.1. Control of environmental exposure: Formulation into mixture (ERC2)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount per site	:	42577 t
Maximum daily site tonnage	:	0,028 t

Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP effluent	:	2.000 m3/d

3.2.2. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Covers indoor and outdoor use.

3.2.3. Control of worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Covers indoor and outdoor use.

3.2.4. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Covers indoor and outdoor use.

3.2.5. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Covers indoor and outdoor use.

3.2.6. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)

Product (article) characteristics
Covers concentrations up to 100 %

Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

3.2.7. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 95 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

3.2.8. Control of worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		

Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

3.2.9. Control of worker exposure: Use as laboratory reagent (PROC15)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Covers indoor and outdoor use.

3.3. Exposure estimation and reference to its source

3.3.1. Environmental release and exposure: Formulation into mixture (ERC2)

Protection Target	Exposure estimate	RCR
Freshwater	0,0025 mg/L	< 0,01
Freshwater sediment	0,00972 mg/kg dry weight	< 0,01
Marine water	0,000246 mg/L	< 0,01
Marine sediment	0,000957 mg/kg dry weight	< 0,01
Agricultural soil	0,00344 mg/kg dry weight	0,045
Sewage treatment plant	0,0000177 mg/L	< 0,01

3.3.2. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		0,031 mg/m³	< 0,01
inhalative	systemic		0,031 mg/m³	< 0,01

3.3.3. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		15,44 mg/m³	0,05
inhalative	systemic		15,44 mg/m³	0,05

3.3.4. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		30,88 mg/m³	0,1
inhalative	systemic		30,88 mg/m³	0,1

3.3.5. Worker exposure: Chemical production where opportunity for exposure arises (PROC4)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		61,77 mg/m³	0,199
inhalative	systemic		61,77 mg/m³	0,199

3.3.6. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		15,44 mg/m³	0,05
inhalative	systemic		15,44 mg/m³	0,05

3.3.7. Worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		3,861 mg/m³	0,012
inhalative	systemic		3,861 mg/m³	0,012

3.3.8. Worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		15,44 mg/m³	0,05
inhalative	systemic		15,44 mg/m³	0,05

3.3.9. Worker exposure: Use as laboratory reagent (PROC15)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		30,88 mg/m³	0,1
inhalative	systemic		30,88 mg/m³	0,1

3.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Data refer to lead substance.

ES 4: Use in coatings; Industrial uses (SU3).

4.1. Title section

Exposure Scenario name	:	Use in coatings
Structured Short Title	:	Use in coatings; Industrial uses (SU3).

Environment		
CS 1	**Use of non-reactive processing aid at industrial site (no inclusion into or onto article)**	ERC4
Worker		
CS 2	**Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions**	PROC1
CS 3	**Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions**	PROC2
CS 4	**Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition**	PROC3
CS 5	**Chemical production where opportunity for exposure arises**	PROC4
CS 6	**Mixing or blending in batch processes**	PROC5
CS 7	**Industrial spraying**	PROC7
CS 8	**Transfer of substance or mixture (charging/discharging) at non dedicated-facilities**	PROC8a
CS 9	**Transfer of substance or mixture (charging/discharging) at dedicated facilities**	PROC8b
CS 10	**Transfer of substance or mixture into small containers (dedicated filling line, including weighing)**	PROC9
CS 11	**Roller application or brushing**	PROC10
CS 12	**Treatment of articles by dipping and pouring**	PROC13
CS 13	**Use as laboratory reagent**	PROC15

4.2. Conditions of use affecting exposure

4.2.1. Control of environmental exposure: Use of non-reactive processing aid at industrial site (no inclusion into or onto article) (ERC4)

Product (article) characteristics

Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount per site	:	3116 t
Maximum daily site tonnage	:	10,39 t
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP effluent	:	2.000 m3/d

4.2.2. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Covers indoor and outdoor use.

4.2.3. Control of worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day

Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Covers indoor and outdoor use.

4.2.4. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Covers indoor and outdoor use.

4.2.5. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Covers indoor and outdoor use.

4.2.6. Control of worker exposure: Mixing or blending in batch processes (PROC5)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

4.2.7. Control of worker exposure: Industrial spraying (PROC7)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Ensure the ventilation system is regularly maintained and tested. Clean equipment and the work area every day.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Room size	:	> 1000 m3
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Ensure that the distance from worker to task is greater than 1 m. Ensure regular inspection, cleaning and maintenance of equipment and machines. Ensure that a spraying booth is used.		

4.2.8. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

4.2.9. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 95 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

4.2.10. Control of worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

4.2.11. Control of worker exposure: Roller application or brushing (PROC10)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

4.2.12. Control of worker exposure: Treatment of articles by dipping and pouring (PROC13)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid

Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

4.2.13. Control of worker exposure: Use as laboratory reagent (PROC15)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Covers indoor and outdoor use.

4.3. Exposure estimation and reference to its source

4.3.1. Environmental release and exposure: Use of non-reactive processing aid at industrial site (no inclusion into or onto article) (ERC4)

Protection Target	Exposure estimate	RCR
Freshwater	0,00249 mg/L	< 0,01
Freshwater sediment	0,00971 mg/kg dry weight	< 0,01
Marine water	0,000246 mg/L	< 0,01
Marine sediment	0,000956 mg/kg dry weight	< 0,01
Agricultural soil	0,0089 mg/kg dry weight	0,116

Sewage treatment plant	0 mg/L	< 0,01

4.3.2. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		0,031 mg/m³	< 0,01
inhalative	systemic		0,031 mg/m³	< 0,01

4.3.3. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		15,44 mg/m³	0,05
inhalative	systemic		15,44 mg/m³	0,05

4.3.4. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		30,88 mg/m³	0,1
inhalative	systemic		30,88 mg/m³	0,1

4.3.5. Worker exposure: Chemical production where opportunity for exposure arises (PROC4)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		61,77 mg/m³	0,199
inhalative	systemic		61,77 mg/m³	0,199

4.3.6. Worker exposure: Mixing or blending in batch processes (PROC5)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		15,44 mg/m³	0,05
inhalative	systemic		15,44 mg/m³	0,05

4.3.7. Worker exposure: Industrial spraying (PROC7)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		0 mg/m³	< 0,01
inhalative	systemic		0 mg/m³	< 0,01

4.3.8. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		15,44 mg/m³	0,05
inhalative	systemic		15,44 mg/m³	0,05

4.3.9. Worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		3,861 mg/m³	0,012
inhalative	systemic		3,861 mg/m³	0,012

4.3.10. Worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		15,44 mg/m³	0,05
inhalative	systemic		15,44 mg/m³	0,05

4.3.11. Worker exposure: Roller application or brushing (PROC10)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		15,44 mg/m³	0,05
inhalative	systemic		15,44 mg/m³	0,05

4.3.12. Worker exposure: Treatment of articles by dipping and pouring (PROC13)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR

inhalative	local		15,44 mg/m³	0,05
inhalative	systemic		15,44 mg/m³	0,05

4.3.13. Worker exposure: Use as laboratory reagent (PROC15)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		30,88 mg/m³	0,1
inhalative	systemic		30,88 mg/m³	0,1

4.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Data refer to lead substance.

ES 5: Use in coatings; Professional uses (SU22).

5.1. Title section

Exposure Scenario name	:	Use in coatings
Structured Short Title	:	Use in coatings; Professional uses (SU22).

Environment		
CS 1	**Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)**	ERC8d
Worker		
CS 2	**Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions**	PROC1
CS 3	**Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions**	PROC2
CS 4	**Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition**	PROC3
CS 5	**Chemical production where opportunity for exposure arises**	PROC4
CS 6	**Mixing or blending in batch processes**	PROC5
CS 7	**Transfer of substance or mixture (charging/discharging) at non dedicated-facilities**	PROC8a
CS 8	**Transfer of substance or mixture (charging/discharging) at dedicated facilities**	PROC8b
CS 9	**Transfer of substance or mixture into small containers (dedicated filling line, including weighing)**	PROC9
CS 10	**Roller application or brushing**	PROC10
CS 11	**Non-industrial spraying**	PROC11
CS 12	**Treatment of articles by dipping and pouring**	PROC13
CS 13	**Use as laboratory reagent**	PROC15
CS 14	**Manual activities involving hand contact**	PROC19

5.2. Conditions of use affecting exposure

5.2.1. Control of environmental exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) (ERC8d)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Daily amount for wide dispersive uses	:	0,2 kg
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant

5.2.2. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Covers indoor and outdoor use.

5.2.3. Control of worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day

Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Covers indoor and outdoor use.

5.2.4. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Covers indoor and outdoor use.

5.2.5. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Covers indoor and outdoor use.

5.2.6. Control of worker exposure: Mixing or blending in batch processes (PROC5)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 240 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

5.2.7. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 240 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

5.2.8. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 240 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 95 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

5.2.9. Control of worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

5.2.10. Control of worker exposure: Roller application or brushing (PROC10)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid

Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 240 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

5.2.11. Control of worker exposure: Non-industrial spraying (PROC11)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Ensure the ventilation system is regularly maintained and tested. Clean equipment and the work area every day.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Room size	:	> 1000 m3
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Ensure that the distance from worker to task is greater than 1 m. Ensure regular inspection, cleaning and maintenance of equipment and machines. Ensure that a spraying booth is used.		

5.2.12. Control of worker exposure: Treatment of articles by dipping and pouring (PROC13)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid

Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 240 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

5.2.13. Control of worker exposure: Use as laboratory reagent (PROC15)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 240 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Covers indoor and outdoor use.

5.2.14. Control of worker exposure: Manual activities involving hand contact (PROC19)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 240 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		

Other conditions affecting workers exposure		
Body parts exposed	:	Assumes that potential dermal contact is limited to hands and forearms.
Indoor or outdoor use	:	Covers indoor and outdoor use.

5.3. Exposure estimation and reference to its source

5.3.1. Environmental release and exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) (ERC8d)

Protection Target	Exposure estimate	RCR
Freshwater	0,00251 mg/L	< 0,01
Freshwater sediment	0,00976 mg/kg dry weight	< 0,01
Marine water	0,000247 mg/L	< 0,01
Marine sediment	0,000962 mg/kg dry weight	< 0,01
Agricultural soil	0,0000976 mg/kg dry weight	< 0,01
Sewage treatment plant	0,000135 mg/L	< 0,01

5.3.2. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		0,031 mg/m³	< 0,01
inhalative	systemic		0,031 mg/m³	< 0,01

5.3.3. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		61,77 mg/m³	0,199
inhalative	systemic		61,77 mg/m³	0,199

5.3.4. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

Exposure route	Health effect	Exposure indica-	Exposure esti-	RCR

		tor	mate	
inhalative	local		77,21 mg/m³	0,249
inhalative	systemic		77,21 mg/m³	0,249

5.3.5. Worker exposure: Chemical production where opportunity for exposure arises (PROC4)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		154,4 mg/m³	0,498
inhalative	systemic		154,4 mg/m³	0,498

5.3.6. Worker exposure: Mixing or blending in batch processes (PROC5)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		185,3 mg/m³	0,598
inhalative	systemic		185,3 mg/m³	0,598

5.3.7. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		185,3 mg/m³	0,598
inhalative	systemic		185,3 mg/m³	0,598

5.3.8. Worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		92,65 mg/m³	0,299
inhalative	systemic		92,65 mg/m³	0,299

5.3.9. Worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		185,3 mg/m³	0,598
inhalative	systemic		185,3 mg/m³	0,598

5.3.10. Worker exposure: Roller application or brushing (PROC10)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		185,3 mg/m³	0,598
inhalative	systemic		185,3 mg/m³	0,598

5.3.11. Worker exposure: Non-industrial spraying (PROC11)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		0 mg/m³	< 0,01
inhalative	systemic		0 mg/m³	< 0,01

5.3.12. Worker exposure: Treatment of articles by dipping and pouring (PROC13)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		185,3 mg/m³	0,598
inhalative	systemic		185,3 mg/m³	0,598

5.3.13. Worker exposure: Use as laboratory reagent (PROC15)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		185,3 mg/m³	0,598
inhalative	systemic		185,3 mg/m³	0,598

5.3.14. Worker exposure: Manual activities involving hand contact (PROC19)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		185,3 mg/m³	0,598
inhalative	systemic		185,3 mg/m³	0,598

5.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Data refer to lead substance.

ES 6: Cleaning; Industrial uses (SU3).

6.1. Title section

Exposure Scenario name	:	Cleaning
Structured Short Title	:	Cleaning; Industrial uses (SU3).

Environment		
CS 1	**Use of non-reactive processing aid at industrial site (no inclusion into or onto article)**	ERC4
Worker		
CS 2	**Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions**	PROC1
CS 3	**Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions**	PROC2
CS 4	**Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition**	PROC3
CS 5	**Chemical production where opportunity for exposure arises**	PROC4
CS 6	**Industrial spraying**	PROC7
CS 7	**Transfer of substance or mixture (charging/discharging) at non dedicated-facilities**	PROC8a
CS 8	**Transfer of substance or mixture (charging/discharging) at dedicated facilities**	PROC8b
CS 9	**Transfer of substance or mixture into small containers (dedicated filling line, including weighing)**	PROC9
CS 10	**Roller application or brushing**	PROC10
CS 11	**Treatment of articles by dipping and pouring**	PROC13

6.2. Conditions of use affecting exposure

6.2.1. Control of environmental exposure: Use of non-reactive processing aid at industrial site (no inclusion into or onto article) (ERC4)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid

Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount per site	:	100 t
Maximum daily site tonnage	:	5 t
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP effluent	:	2.000 m3/d

6.2.2. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Covers indoor and outdoor use.

6.2.3. Control of worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		

Other conditions affecting workers exposure		
Indoor or outdoor use	:	Covers indoor and outdoor use.

6.2.4. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Covers indoor and outdoor use.

6.2.5. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Covers indoor and outdoor use.

6.2.6. Control of worker exposure: Industrial spraying (PROC7)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Ensure the ventilation system is regularly maintained and tested. Clean equipment and the work area every day.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Room size	:	> 1000 m3
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Ensure that the distance from worker to task is greater than 1 m. Ensure regular inspection, cleaning and maintenance of equipment and machines. Ensure that a spraying booth is used.		

6.2.7. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

6.2.8. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 95 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

6.2.9. Control of worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

6.2.10. Control of worker exposure: Roller application or brushing (PROC10)

Product (article) characteristics

Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

6.2.11. Control of worker exposure: Treatment of articles by dipping and pouring (PROC13)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

6.3. Exposure estimation and reference to its source

6.3.1. Environmental release and exposure: Use of non-reactive processing aid at industrial site (no inclusion into or onto article) (ERC4)

Protection Target	Exposure estimate	RCR
Freshwater	0,00562 mg/L	0,014
Freshwater sediment	0,022 mg/kg dry weight	0,014

Marine water	0,000558 mg/L	0,014
Marine sediment	0,000956 mg/kg dry weight	< 0,01
Agricultural soil	0,00811 mg/kg dry weight	0,106
Sewage treatment plant	0,031 mg/L	< 0,01

6.3.2. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		0,031 mg/m³	< 0,01
inhalative	systemic		0,031 mg/m³	< 0,01

6.3.3. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		15,44 mg/m³	0,05
inhalative	systemic		15,44 mg/m³	0,05

6.3.4. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		30,88 mg/m³	0,1
inhalative	systemic		30,88 mg/m³	0,1

6.3.5. Worker exposure: Chemical production where opportunity for exposure arises (PROC4)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		61,77 mg/m³	0,199
inhalative	systemic		61,77 mg/m³	0,199

6.3.6. Worker exposure: Industrial spraying (PROC7)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		0 mg/m³	< 0,01

inhalative	systemic		0 mg/m³	< 0,01

6.3.7. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		15,44 mg/m³	0,05
inhalative	systemic		15,44 mg/m³	0,05

6.3.8. Worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		3,861 mg/m³	0,012
inhalative	systemic		3,861 mg/m³	0,012

6.3.9. Worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		15,44 mg/m³	0,05
inhalative	systemic		15,44 mg/m³	0,05

6.3.10. Worker exposure: Roller application or brushing (PROC10)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		15,44 mg/m³	0,05
inhalative	systemic		15,44 mg/m³	0,05

6.3.11. Worker exposure: Treatment of articles by dipping and pouring (PROC13)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		15,44 mg/m³	0,05
inhalative	systemic		15,44 mg/m³	0,05

6.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Data refer to lead substance.

ES 7: Cleaning; Professional uses (SU22).

7.1. Title section

Exposure Scenario name	:	Cleaning
Structured Short Title	:	Cleaning; Professional uses (SU22).

Environment		
CS 1	**Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)**	ERC8d
Worker		
CS 2	**Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions**	PROC1
CS 3	**Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions**	PROC2
CS 4	**Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition**	PROC3
CS 5	**Chemical production where opportunity for exposure arises**	PROC4
CS 6	**Transfer of substance or mixture (charging/discharging) at non dedicated-facilities**	PROC8a
CS 7	**Transfer of substance or mixture (charging/discharging) at dedicated facilities**	PROC8b
CS 8	**Transfer of substance or mixture into small containers (dedicated filling line, including weighing)**	PROC9
CS 9	**Roller application or brushing**	PROC10
CS 10	**Non-industrial spraying**	PROC11
CS 11	**Treatment of articles by dipping and pouring**	PROC13

7.2. Conditions of use affecting exposure

7.2.1. Control of environmental exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) (ERC8d)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid

Amount used (or contained in articles), frequency and duration of use/exposure		
Daily amount for wide dispersive uses	:	0,024 kg
Emission days	:	365
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP effluent	:	2.000 m3/d
Other conditions affecting environmental exposure		
Receiving surface water flow	:	18.000 m3/d
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

7.2.2. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Covers indoor and outdoor use.

7.2.3. Control of worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid

Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Covers indoor and outdoor use.

7.2.4. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Covers indoor and outdoor use.

7.2.5. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		

Other conditions affecting workers exposure		
Indoor or outdoor use	:	Covers indoor and outdoor use.

7.2.6. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 240 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

7.2.7. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 240 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 95 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

7.2.8. Control of worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 240 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

7.2.9. Control of worker exposure: Roller application or brushing (PROC10)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 240 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

7.2.10. Control of worker exposure: Non-industrial spraying (PROC11)

Product (article) characteristics
Covers concentrations up to 100 %

Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Clean equipment and the work area every day. Ensure the ventilation system is regularly maintained and tested.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Room size	:	> 1000 m3
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Ensure that the distance from worker to task is greater than 1 m. Ensure regular inspection, cleaning and maintenance of equipment and machines. Ensure that a spraying booth is used.		

7.2.11. Control of worker exposure: Treatment of articles by dipping and pouring (PROC13)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 240 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

7.3. Exposure estimation and reference to its source

7.3.1. Environmental release and exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) (ERC8d)

Protection Target	Exposure estimate	RCR
Freshwater	0,00249 mg/L	< 0,01
Freshwater sediment	0,00971 mg/kg dry weight	< 0,01
Marine water	0,000246 mg/L	< 0,01
Marine sediment	0,000956 mg/kg dry weight	< 0,01
Agricultural soil	0,0000969 mg/kg dry weight	< 0,01
Sewage treatment plant	< 0,00001 mg/L	< 0,01

7.3.2. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		0,031 mg/m³	< 0,01
inhalative	systemic		0,031 mg/m³	< 0,01

7.3.3. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		61,77 mg/m³	0,199
inhalative	systemic		61,77 mg/m³	0,199

7.3.4. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		77,21 mg/m³	0,249
inhalative	systemic		77,21 mg/m³	0,249

7.3.5. Worker exposure: Chemical production where opportunity for exposure arises (PROC4)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		154,4 mg/m³	0,498
inhalative	systemic		154,4 mg/m³	0,498

7.3.6. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		185,3 mg/m³	0,598
inhalative	systemic		185,3 mg/m³	0,598

7.3.7. Worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		92,65 mg/m³	0,299
inhalative	systemic		92,65 mg/m³	0,299

7.3.8. Worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		185,3 mg/m³	0,598
inhalative	systemic		185,3 mg/m³	0,598

7.3.9. Worker exposure: Roller application or brushing (PROC10)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		185,3 mg/m³	0,598
inhalative	systemic		185,3 mg/m³	0,598

7.3.10. Worker exposure: Non-industrial spraying (PROC11)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		0 mg/m³	< 0,01
inhalative	systemic		0 mg/m³	< 0,01

7.3.11. Worker exposure: Treatment of articles by dipping and pouring (PROC13)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR

inhalative	local		185,3 mg/m³	0,598
inhalative	systemic		185,3 mg/m³	0,598

7.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Data refer to lead substance.

ES 8: Use in laboratories; Professional uses (SU22).

8.1. Title section

Exposure Scenario name	:	Use in laboratories
Structured Short Title	:	Use in laboratories; Professional uses (SU22).

Environment		
CS 1	**Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)**	ERC8a
Worker		
CS 2	**Roller application or brushing**	PROC10
CS 3	**Use as laboratory reagent**	PROC15

8.2. Conditions of use affecting exposure

8.2.1. Control of environmental exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Daily amount for wide dispersive uses	:	< 0,001 kg
Emission days	:	365
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant

8.2.2. Control of worker exposure: Roller application or brushing (PROC10)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid

Amount used (or contained in articles), frequency and duration of use/exposure	
Use frequency	: Covers exposure up to 240 min/day
Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 90 %	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

8.2.3. Control of worker exposure: Use as laboratory reagent (PROC15)

Product (article) characteristics	
Covers concentrations up to 100 %	
Physical form of product	: Liquid
Amount used (or contained in articles), frequency and duration of use/exposure	
Use frequency	: Covers exposure up to 480 min/day
Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Covers indoor and outdoor use.

8.3. Exposure estimation and reference to its source

8.3.1. Environmental release and exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a)

Protection Target	Exposure estimate	RCR
Freshwater	0,0025 mg/L	< 0,01
Freshwater sediment	0,00974 mg/kg dry weight	< 0,01
Marine water	0,000246 mg/L	< 0,01
Marine sediment	0,000959 mg/kg dry weight	< 0,01
Agricultural soil	0,0000973 mg/kg dry weight	< 0,01

Sewage treatment plant	< 0,0000685 mg/L	< 0,01

8.3.2. Worker exposure: Roller application or brushing (PROC10)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		185,25 mg/m³	0,598
inhalative	systemic		185,25 mg/m³	0,598

8.3.3. Worker exposure: Use as laboratory reagent (PROC15)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		30,88 mg/m³	0,1
inhalative	systemic		30,88 mg/m³	0,1

8.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Data refer to lead substance.

ES 9: Polymerisation; Industrial uses (SU3).

9.1. Title section

Exposure Scenario name	:	Polymerisation
Structured Short Title	:	Polymerisation; Industrial uses (SU3).

Environment		
CS 1	**Use of non-reactive processing aid at industrial site (no inclusion into or onto article)**	ERC4
Worker		
CS 2	**Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions**	PROC1
CS 3	**Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions**	PROC2
CS 4	**Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition**	PROC3
CS 5	**Chemical production where opportunity for exposure arises**	PROC4
CS 6	**Transfer of substance or mixture (charging/discharging) at non dedicated-facilities**	PROC8a
CS 7	**Transfer of substance or mixture (charging/discharging) at dedicated facilities**	PROC8b
CS 8	**Transfer of substance or mixture into small containers (dedicated filling line, including weighing)**	PROC9

9.2. Conditions of use affecting exposure

9.2.1. Control of environmental exposure: Use of non-reactive processing aid at industrial site (no inclusion into or onto article) (ERC4)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount per site	:	5000 t
Maximum daily site tonnage	:	16,67 t

Technical and organisational conditions and measures		
Do not apply industrial sludge to natural soils.		
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP effluent	:	2.000 m3/d

9.2.2. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Covers indoor and outdoor use.

9.2.3. Control of worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Other conditions affecting workers exposure		

Indoor or outdoor use	:	Covers indoor and outdoor use.

9.2.4. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Covers indoor and outdoor use.

9.2.5. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Covers indoor and outdoor use.

9.2.6. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

9.2.7. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 95 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

9.2.8. Control of worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

Product (article) characteristics
Covers concentrations up to 100 %

Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	Covers exposure up to 480 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

9.3. Exposure estimation and reference to its source

9.3.1. Environmental release and exposure: Use of non-reactive processing aid at industrial site (no inclusion into or onto article) (ERC4)

Protection Target	Exposure estimate	RCR
Freshwater	0,00249 mg/L	< 0,01
Freshwater sediment	0,00971 mg/kg dry weight	< 0,01
Marine water	0,000246 mg/L	< 0,01
Marine sediment	0,000956 mg/kg dry weight	< 0,01
Agricultural soil	0,038 mg/kg dry weight	0,542
Sewage treatment plant	0 mg/L	< 0,01

9.3.2. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		0,031 mg/m³	< 0,01
inhalative	systemic		0,031 mg/m³	< 0,01

9.3.3. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		15,44 mg/m³	0,05

inhalative	systemic		15,44 mg/m³	0,05

9.3.4. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		30,88 mg/m³	0,1
inhalative	systemic		30,88 mg/m³	0,1

9.3.5. Worker exposure: Chemical production where opportunity for exposure arises (PROC4)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		61,77 mg/m³	0,199
inhalative	systemic		61,77 mg/m³	0,199

9.3.6. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		15,44 mg/m³	0,05
inhalative	systemic		15,44 mg/m³	0,05

9.3.7. Worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		3,861 mg/m³	0,012
inhalative	systemic		3,861 mg/m³	0,012

9.3.8. Worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	local		15,44 mg/m³	0,05
inhalative	systemic		15,44 mg/m³	0,05

9.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Data refer to lead substance.