SAFETY DATA SHEET

POTASSIUM BIFLUORIDE

Compilation date: 29/11/2010

Revision date: 29/10/2015

Revision No: 4.1

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

1.1. Product identifier

Product name: POTASSIUM BIFLUORIDE

REACH registered number(s): 01-2119960644-32-XXXX

CAS number: 7789-29-9

EINECS number: 232-156-2

Index number: 009-008-00-9

Product code: 7570-025

Synonyms: POTASSIUM ACID FLUORIDE

POTASSIUM HYDROGEN DIFLUORIDE

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

Use of substance / mixture: Alkylation catalyst. Fluorine production electrolyte. Glass frosting agent. Welding and soldering agents. Chemical intermediate. Metal treatment.

1.3. Details of the supplier of the safety data sheet

Company name: Resource Chemical Ltd

Resource House

76 High Street

Brackley

Northants

NN13 7DS

Tel: +44(0)1280 843800

Fax: +44(0)1280 701745

Email: sales@resourcechemical.ltd.uk

1.4. Emergency telephone number

Emergency tel: +44(0)1270 502891

Section 2: Hazards identification

2.1. Classification of the substance or mixture

Classification under CLP: Acute Tox. 3: H301; Skin Corr. 1B: H314

Most important adverse effects: Toxic if swallowed. Causes severe skin burns and eye damage.

2.2. Label elements

Label elements:

Hazard statements: H301: Toxic if swallowed.

H314: Causes severe skin burns and eye damage.

[cont...]

Signal words: Danger

Hazard pictograms: GHS05: Corrosion

GHS06: Skull and crossbones

Precautionary statements: P260: Do not breathe dust/fumes/gas/mist/vapours/spray.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

P303+361+353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

P305+351+338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P310: Immediately call a POISON CENTER/doctor/physician.

2.3. Other hazards

PBT: This product is not identified as a PBT/vPvB substance.

Section 3: Composition/information on ingredients

3.1. Substances

Chemical identity: POTASSIUM BIFLUORIDE

CAS number: 7789-29-9

EINECS number: 232-156-2

REACH registered number(s): 01-2119960644-32-XXXX

Section 4: First aid measures

4.1. Description of first aid measures

Skin contact: Remove all contaminated clothes and footwear immediately unless stuck to skin. Drench the affected skin with running water for 10 minutes or longer if substance is still on skin. Transfer to hospital if there are burns or symptoms of poisoning. Massage calcium gluconate gel into burnt area

Eye contact: Bathe the eye with running water for 15 minutes. Transfer to hospital for specialist examination.

Ingestion: Wash out mouth with water. Do not induce vomiting. Give 1 cup of water to drink every 10 minutes. If unconscious, check for breathing and apply artificial respiration if necessary. If unconscious and breathing is OK, place in the recovery position. Transfer to hospital as soon as possible. Give 6 effervesant soluble calcium tablets

Inhalation: Remove casualty from exposure ensuring one's own safety whilst doing so. If unconscious and breathing is OK, place in the recovery position. If conscious, ensure the casualty sits or lies down. If breathing becomes bubbly, have the casualty sit and provide oxygen if available. Transfer to hospital as soon as possible.

[cont...]

4.2. Most important symptoms and effects, both acute and delayed

Skin contact: Blistering may occur. Progressive ulceration will occur if treatment is not immediate.

Eye contact: Corneal burns may occur. May cause permanent damage.

Ingestion: Corrosive burns may appear around the lips. Blood may be vomited. There may be bleeding from the mouth or nose.

Inhalation: There may be shortness of breath with a burning sensation in the throat. Exposure may cause coughing or wheezing.

Delayed / immediate effects: Immediate effects can be expected after short-term exposure.

4.3. Indication of any immediate medical attention and special treatment needed

Immediate / special treatment: Immediate medical attention is required. Show this safety data sheet to the doctor in attendance. Eye bathing equipment should be available on the premises.

Section 5: Fire-fighting measures

5.1. Extinguishing media

Extinguishing media: Suitable extinguishing media for the surrounding fire should be used. Do not use water.

5.2. Special hazards arising from the substance or mixture

Exposure hazards: Corrosive. Toxic. In combustion emits toxic fumes.

5.3. Advice for fire-fighters

Advice for fire-fighters: Wear self-contained breathing apparatus. Wear protective clothing to prevent contact with skin and eyes.

Section 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions: Notify the police and fire brigade immediately. If outside keep bystanders upwind and away from danger point. Mark out the contaminated area with signs and prevent access to unauthorised personnel. Do not attempt to take action without suitable protective clothing - see section 8 of SDS. Do not create dust.

6.2. Environmental precautions

Environmental precautions: Do not discharge into drains or rivers.

6.3. Methods and material for containment and cleaning up

Clean-up procedures: Clean-up should be dealt with only by qualified personnel familiar with the specific substance. Transfer to a closable, labelled salvage container for disposal by an appropriate method.

6.4. Reference to other sections

Reference to other sections: Refer to section 8 of SDS. Refer to section 13 of SDS.

[cont...]

Section 7: Handling and storage

7.1. Precautions for safe handling

Handling requirements: Avoid direct contact with the substance. Ensure there is sufficient ventilation of the area. Do not handle in a confined space. Avoid the formation or spread of dust in the air. Use only with closed system ventilation.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions: Store in a cool, well ventilated area. Keep container tightly closed.

7.3. Specific end use(s)

Specific end use(s): No special requirement.

Section 8: Exposure controls/personal protection

8.1. Control parameters

Workplace exposure limits: **Respirable dust**

State	8 hour TWA	15 min. STEL	8 hour TWA	15 min. STEL
UK	2.5 mg/m3	-	-	-

DNEL/PNEC Values

POTASSIUM BIFLUORIDE

Type	Exposure	Value	Population	Effect
DNEL	Inhalation (repeated dose)	3.1mg/m3	Workers	Systemic
DNEL	Inhalation	5.1mg/m3	Workers	Local
DNEL	Oral	0.24mg/kg	Consumers	Systemic
PNEC	Fresh water	0.9mg/l	-	-
PNEC	Fresh water sediments	0.766mg/kg	-	-
PNEC	Marine water	0.9mg/l	-	-
PNEC	Microorganisms in sewage treatment	51mg/1	-	-
PNEC	Soil (agricultural)	11mg/kg	-	-

8.2. Exposure controls

Engineering measures: Ensure there is sufficient ventilation of the area.

Respiratory protection: Respiratory protective device with particle filter. Particle filter class P2S (EN143). Self-contained breathing apparatus must be available in case of emergency.

Hand protection: Protective gloves. PVC gloves. Neoprene gloves.

Eye protection: Tightly fitting safety goggles. Ensure eye bath is to hand.

Skin protection: Protective clothing.

Environmental: Refer to specific Member State legislation for requirements under Community environmental legislation.

[cont...]

Section 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

State: Solid

Colour: White

Odour: Pungent

Evaporation rate: No data available.

Oxidising: Non-oxidising (by EC criteria)

Solubility in water: Soluble

Viscosity: No data available.

Boiling point/range℃: No data available.

Melting point/range℃: 239.5

Flammability limits %: lower: No data available.

upper: No data available.

Flash point℃: No data available.

Part.coeff. n-octanol/water: No data available.

Autoflammability℃: >400

Vapour pressure: No data available.

Relative density: 2.37

pH: 1

VOC g/l: No data available.

9.2. Other information

Other information: No data available.

Section 10: Stability and reactivity

10.1. Reactivity

Reactivity: Stable under recommended transport or storage conditions.

10.2. Chemical stability

Chemical stability: Stable under normal conditions.

10.3. Possibility of hazardous reactions

Hazardous reactions: Hazardous reactions will not occur under normal transport or storage conditions.

Decomposition may occur on exposure to conditions or materials listed below.

10.4. Conditions to avoid

Conditions to avoid: Heat.

10.5. Incompatible materials

Materials to avoid: Strong oxidising agents. Strong acids.

10.6. Hazardous decomposition products

Haz. decomp. products: In combustion emits toxic fumes of hydrogen fluoride.

Section 11: Toxicological information

11.1. Information on toxicological effects

[cont...]

Toxicity values:

Route	Species	Test	Value	Units
ORL	RAT	LD50	52-250	mg/kg

Relevant hazards for substance:

Hazard	Route	Basis
Acute toxicity (ac. tox. 3)	ING	Hazardous: calculated
Skin corrosion/irritation	DRM	Hazardous: calculated
Serious eye damage/irritation	OPT	Hazardous: calculated

Symptoms / routes of exposure

Skin contact: Blistering may occur. Progressive ulceration will occur if treatment is not immediate.

Eye contact: Corneal burns may occur. May cause permanent damage.

Ingestion: Corrosive burns may appear around the lips. Blood may be vomited. There may be bleeding from the mouth or nose.

Inhalation: There may be shortness of breath with a burning sensation in the throat. Exposure may cause coughing or wheezing.

Delayed / immediate effects: Immediate effects can be expected after short-term exposure.

Other information: Not applicable.

Section 12: Ecological information

12.1. Toxicity

Ecotoxicity values:

Species	Test	Value	Units
Daphnia magna	48H EC50	48	mg/l
FISH	96H LC50	51	mg/l
ALGAE	96H ErC50	43	mg/l

12.2. Persistence and degradability

Persistence and degradability: Not biodegradable.

12.3. Bioaccumulative potential

Bioaccumulative potential: Bioaccumulation potential.

12.4. Mobility in soil

Mobility: Absorbed only slowly into soil.

12.5. Results of PBT and vPvB assessment

PBT identification: This product is not identified as a PBT/vPvB substance.

[cont...]

12.6. Other adverse effects

Other adverse effects: Negligible ecotoxicity.

Section 13: Disposal considerations

13.1. Waste treatment methods

Disposal operations: Mix or disolve with a combustible material and burn in a chemical incinerator equipped with afterburners and scrubbers.

Disposal of packaging: Dispose of in a regulated landfill site or other method for hazardous or toxic wastes.

NB: The user's attention is drawn to the possible existence of regional or national regulations regarding disposal.

Section 14: Transport information

14.1. UN number

UN number: UN1811

14.2. UN proper shipping name

Shipping name: POTASSIUM HYDROGENDIFLUORIDE, SOLID

14.3. Transport hazard class(es)

Transport class: 8 (6.1)

14.4. Packing group

Packing group: II

14.5. Environmental hazards

Environmentally hazardous: No

Marine pollutant: No

14.6. Special precautions for user

Special precautions: No special precautions.

Tunnel code: E

Transport category: 2

Section 15: Regulatory information

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

Specific regulations: This product is a Seveso category/named substance in Annex I of Council Directive 96/82/EC.

15.2. Chemical Safety Assessment

Chemical safety assessment: A chemical safety assessment has been carried out for the substance or the mixture by the supplier.

Section 16: Other information

[cont...]

Other information

Other information: This safety data sheet is prepared in accordance with Commission Regulation (EU) No 453/2010.

This safety data sheet is prepared in accordance with Commission Regulation (EC) No 1272/2008.

Phrases used in s.2 and s.3: H301: Toxic if swallowed.

H314: Causes severe skin burns and eye damage.

Legal disclaimer: The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. This company shall not be held liable for any damage resulting from handling or from contact with the above product.

Annex

Scenario List

1. ES1 : Manufacture of substance, (fluor electrolysis)

1.1. Scenario description

Main User Groups	:	**SU 3**	Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	:	**SU8**	Manufacture of bulk, large scale chemicals (including petroleum products)
		SU9	Manufacture of fine chemicals
Environmental release category	:	**ERC4**	Industrial use of processing aids in processes and products, not becoming part of articles
Process category	:	**PROC1**	Use in closed process, no likelihood of exposure
		PROC2	Use in closed, continuous process with occasional controlled exposure
Product category	:	**PC19**	Intermediate

1.2. Conditions of use affecting exposure

1.2.1 Contributing scenario controlling environmental exposure for: ERC4 Industrial use of processing aids in processes and products, not becoming part of articles, Onsite STP

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).

Amount

Maximal annual amount used	:	100 t
Maximum daily site tonnage (kg/day):	:	333 kg
Local daily emission to waste water	:	15.55 kg
Maximum daily local emission to air	:	3.4 kg
Local daily emission to soil	:	16.65 kg

Environmental factors

Flow rate	:	18,000 m3/d
Dilution Factor (River)	:	20

Other given operational conditions affecting environmental exposure

Number of emission days per year	:	300

Conditions and measures related to sewage treatment plant

Type of Sewage Treatment Plant	:	Onsite STP
Flow rate of sewage treatment plant effluent	:	2,000 m3/d

Conditions and measures related to external treatment of waste for disposal

Waste treatment	:	Neutralisation of the effluents before releases should be considered.

1.2.2 Contributing scenario controlling environmental exposure for: ERC4 Industrial use of processing aids in processes and products, not becoming part of articles, Municipal STP

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).

Amount

Maximal annual amount used	:	1.5 t
Maximum daily site tonnage (kg/day):	:	7 kg

Environmental factors

Flow rate	:	18,000 m3/d

Other given operational conditions affecting environmental exposure

Number of emission days per year	:	300

Conditions and measures related to sewage treatment plant

Type of Sewage Treatment Plant	:	Municipal STP
Flow rate of sewage treatment plant effluent	:	2,000 m3/d

1.2.3 Contributing scenario controlling worker exposure for: PROC1 Use in closed process, no likelihood of exposure

Product characteristics

Concentration of the Substance in Mixture/Article		Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Dustiness: High

Frequency and duration of use

Exposure duration	:	< 8 h

Other operational conditions affecting workers exposure

Outdoor / Indoor	:	Indoor
Remarks	:	Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Provide a basic standard of general ventilation (1 to 3 air changes per hour) .

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374., Use suitable eye protection.

1.2.4 Contributing scenario controlling worker exposure for: PROC2 Use in closed, continuous process with occasional controlled exposure

Product characteristics

Concentration of the Substance in Mixture/Article		Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Dustiness: High

Frequency and duration of use

Exposure duration	:	< 8 h

Other operational conditions affecting workers exposure

Outdoor / Indoor	:	Indoor
Remarks	:	Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Provide a basic standard of general ventilation (1 to 3 air changes per hour) .
Local exhaust ventilation - efficiency of at least (Effectiveness (of a measure): 90 %)

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374.
Use suitable eye protection.

1.3. Exposure estimation and reference to its source

Environment

Release factor	Value type	Compartment	Environmental exposure	RCR
ERC4	Local PEC	Fresh water	0.4 mg/l	0.444 Onsite STP
		Fresh water sediment	3.33 mg/kg (dw)	0.946 Onsite STP
		STP	0 mg/l	< 0.01 Onsite STP
		Agricultural soil	0.006 mg/kg (dw)	< 0.01 Onsite STP
	Regional PEC	Fresh water	0.004 mg/l	< 0.01
		Fresh water sediment	0.029 mg/kg (dw)	< 0.01
		Marine water	< 0.0004 mg/l	
		Marine sediment	0.003 mg/kg (dw)	
		Air	< 0.0001 mg/m³	
		Agricultural soil	0.003 mg/kg (dw)	< 0.01
	Local PEC	Fresh water	0.383 mg/l	0.426 Municipal STP
		Fresh water sediment	3.193 mg/kg (dw)	0.907 Municipal STP
		STP	3.479 mg/l	0.068 Municipal STP
		Agricultural soil	0.26 mg/kg (dw)	0.024 Municipal STP
	Regional PEC	Fresh water	0.004 mg/l	< 0.01
		Fresh water sediment	0.029 mg/kg (dw)	< 0.01
		Marine water	< 0.0004 mg/l	
		Marine sediment	0.003 mg/kg (dw)	
		Air	< 0.0001 mg/m³	
		Agricultural soil	0.003 mg/kg (dw)	< 0.01

Human Health

Contributing Scenario	Specific conditions	Value type	Level of Exposure	RCR
PROC1		Worker - inhalative, long-term - systemic	0.01 mg/m³	0.003
		Worker - inhalative, short-term - local	0.04 mg/m³	0.008
PROC2		Worker - inhalative, long-term - systemic	0.1 mg/m³	0.032
		Worker - inhalative, short-term - local	0.4 mg/m³	0.078

RCR = Risk characterisation ratio

ERC4 Exposure Assessment Method : Used EUSES model.

PROC1 PROC2	Exposure Assessment Method : ECETOC TRA v3.0 worker

1.4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

1.4.1 Environment
If a DU has OC/RMMs outside specifications in the ES, then the DU can evaluate whether he works inside the boundaries set by the ES through scaling in EUSES.
The main driving parameters are :
- local amount used (tonnage)
- release factor prior to on-site treatment
- on-site wastewater treatment presence and efficiency
- dilution factor,Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1.4.2 Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented., Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

2. ES2 : Used as chemical intermediate

2.1. Scenario description

Main User Groups	:	**SU 3**	Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	:	**SU8**	Manufacture of bulk, large scale chemicals (including petroleum products)
		SU9	Manufacture of fine chemicals
Environmental release category	:	**ERC6a**	Industrial use resulting in manufacture of another substance (use of intermediates)
Process category	:	**PROC2**	Use in closed, continuous process with occasional controlled exposure
		PROC3	Use in closed batch process (synthesis or formulation)

2.2. Conditions of use affecting exposure

2.2.1 Contributing scenario controlling environmental exposure for: ERC6a Industrial use resulting in manufacture of another substance (use of intermediates), Onsite STP

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).

Amount

Maximum daily site tonnage (kg/day):	:	750 kg
Maximal annual amount used	:	75 t
Local daily emission to waste water	:	15 kg
Maximum daily local emission to air	:	11 kg
Local daily emission to soil	:	0.75 kg

Environmental factors

Flow rate	:	18,000 m3/d
Dilution Factor (River)	:	20

Other given operational conditions affecting environmental exposure

Continuous exposure		
Number of emission days per year	:	100

Conditions and measures related to sewage treatment plant

Type of Sewage Treatment Plant	:	Onsite STP
Flow rate of sewage treatment plant effluent	:	2,000 m3/d

Conditions and measures related to external treatment of waste for disposal

Waste treatment	:	Neutralisation of the effluents before releases should be considered.

2.2.2 Contributing scenario controlling environmental exposure for: ERC6a Industrial use resulting in manufacture of another substance (use of intermediates), Municipal STP

Product characteristics

Concentration of the Substance in	:	Covers the percentage of the substance in the product up to 100 %

Mixture/Article		(unless stated differently).

Amount

Maximal annual amount used	:	30 t
Maximum daily site tonnage (kg/day):	:	300 kg

Environmental factors

Flow rate	:	18,000 m3/d

Other given operational conditions affecting environmental exposure

Number of emission days per year	:	100

Conditions and measures related to sewage treatment plant

Type of Sewage Treatment Plant	:	Municipal STP
Flow rate of sewage treatment plant effluent	:	2,000 m3/d

2.2.3 Contributing scenario controlling worker exposure for: PROC2 Use in closed, continuous process with occasional controlled exposure , PROC3 Use in closed batch process (synthesis or formulation)

Product characteristics

Concentration of the Substance in Mixture/Article		Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Dustiness: High

Frequency and duration of use

Exposure duration	:	< 8 h

Other operational conditions affecting workers exposure

Outdoor / Indoor	:	Indoor
Remarks	:	Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Provide a basic standard of general ventilation (1 to 3 air changes per hour) .
Local exhaust ventilation - efficiency of at least (Effectiveness (of a measure): 90 %)

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374.
Use suitable eye protection.

2.3. Exposure estimation and reference to its source

Environment

Release factor	Value type	Compartment	Environmental exposure	RCR
ERC6a	Local PEC	Fresh water	0.4 mg/l	0.444 Onsite STP
		Fresh water sediment	3.33 mg/kg (dw)	0.946 Onsite STP
		STP	0 mg/l	< 0.01 Onsite STP
		Agricultural soil	0.006 mg/kg (dw)	< 0.01 Onsite STP
	Regional PEC	Fresh water	0.004 mg/l	< 0.01
		Fresh water sediment	0.029 mg/kg (dw)	< 0.01
		Marine water	< 0.0004 mg/l	
		Marine sediment	0.003 mg/kg (dw)	
		Air	< 0.0001 mg/m³	
		Agricultural soil	0.003 mg/kg (dw)	< 0.01
	Local PEC	Fresh water	0.333 mg/l	0.37 Municipal STP
		Fresh water sediment	2.778 mg/kg (dw)	0.789 Municipal STP
		STP	2.982 mg/l	0.058 Municipal STP
		Agricultural soil	0.231 mg/kg (dw)	0.021 Municipal STP
	Regional PEC	Fresh water	0.004 mg/l	< 0.01
		Fresh water sediment	0.029 mg/kg (dw)	< 0.01
		Marine water	< 0.0004 mg/l	
		Marine sediment	0.003 mg/kg (dw)	
		Air	< 0.0001 mg/m³	
		Agricultural soil	0.003 mg/kg (dw)	< 0.01

Human Health

Contributing Scenario	Specific conditions	Value type	Level of Exposure	RCR
PROC2, PROC3		Worker - inhalative, long-term - systemic	0.1 mg/m³	0.032
		Worker - inhalative, short-term - local	0.4 mg/m³	0.078

RCR = Risk characterisation ratio

ERC6a Exposure Assessment Method : Used EUSES model.

PROC2, PROC3 Exposure Assessment Method : ECETOC TRA v3.0 worker

2.4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

2.4.1 Environment

If a DU has OC/RMMs outside specifications in the ES, then the DU can evaluate whether he works inside the boundaries set by the ES through scaling in EUSES.
The main driving parameters are :
- local amount used (tonnage)
- release factor prior to on-site treatment
- on-site wastewater treatment presence and efficiency
- dilution factor,Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

2.4.2 Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented., Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

3. ES3 : Use in formulation

3.1. Scenario description

Main User Groups	:	**SU 3**	Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category	:	**ERC2**	Formulation of preparations
Process category	:	**PROC2**	Use in closed, continuous process with occasional controlled exposure
		PROC3	Use in closed batch process (synthesis or formulation)
		PROC5	Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact)
		PROC8a	Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities
		PROC8b	Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities
		PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

3.2. Conditions of use affecting exposure

3.2.1 Contributing scenario controlling environmental exposure for: ERC2 Formulation of preparations, Onsite STP

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).

Amount

Maximum daily site tonnage (kg/day):	:	3,500 kg
Maximal annual amount used	:	175 t
Local daily emission to waste water	:	15.55 kg
Maximum daily local emission to air	:	20 kg
Local daily emission to soil	:	0.35 kg

Environmental factors

Flow rate	:	18,000 m3/d
Dilution Factor (River)	:	20

Other given operational conditions affecting environmental exposure

Continuous exposure		
Number of emission days per year	:	50

Conditions and measures related to sewage treatment plant

Type of Sewage Treatment Plant	:	Onsite STP
Flow rate of sewage treatment plant effluent	:	2,000 m3/d

Conditions and measures related to external treatment of waste for disposal

Waste treatment	:	Neutralisation of the effluents before releases should be considered.

3.2.2 Contributing scenario controlling environmental exposure for: ERC2 Formulation of preparations, Municipal STP

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).

Amount

Maximal annual amount used	:	60 t
Maximum daily site tonnage (kg/day):	:	300 kg

Environmental factors

Flow rate	:	18,000 m3/d

Other given operational conditions affecting environmental exposure

Number of emission days per year	:	50

Conditions and measures related to sewage treatment plant

Type of Sewage Treatment Plant	:	Municipal STP
Flow rate of sewage treatment plant effluent	:	2,000 m3/d

3.2.3 Contributing scenario controlling worker exposure for: PROC2 Use in closed, continuous process with occasional controlled exposure

Product characteristics

Concentration of the Substance in Mixture/Article		Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Dustiness: High

Frequency and duration of use

Exposure duration	:	< 8 h

Other operational conditions affecting workers exposure

Outdoor / Indoor	:	Indoor
Remarks	:	Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Provide a basic standard of general ventilation (1 to 3 air changes per hour) .
Local exhaust ventilation - efficiency of at least (Effectiveness (of a measure): 90 %)

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374.
Use suitable eye protection.

3.2.4 Contributing scenario controlling worker exposure for: PROC3 Use in closed batch process (synthesis or formulation) , PROC5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) , PROC8a Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities , PROC8b Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities , PROC9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Product characteristics

Concentration of the Substance in Mixture/Article		Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Dustiness: High

Frequency and duration of use

Exposure duration	:	< 8 h

Other operational conditions affecting workers exposure

Outdoor / Indoor	:	Indoor
Remarks	:	Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Provide a basic standard of general ventilation (1 to 3 air changes per hour) .
Local exhaust ventilation - efficiency of at least (Effectiveness (of a measure): 90 %)

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374., Wear a respirator conforming to EN141 with Type A/P2 filter or better.
Use suitable eye protection.

3.3. Exposure estimation and reference to its source

Environment

Release factor	Value type	Compartment	Environmental exposure	RCR
ERC2	Local PEC	Fresh water	0.4 mg/l	0.444 Onsite STP
		Fresh water sediment	3.33 mg/kg (dw)	0.946 Onsite STP
		STP	0 mg/l	< 0.01 Onsite STP
		Agricultural soil	0.006 mg/kg (dw)	< 0.01 Onsite STP
	Regional PEC	Fresh water	0.004 mg/l	< 0.01
		Fresh water sediment	0.029 mg/kg (dw)	< 0.01
		Marine water	< 0.0004 mg/l	
		Marine sediment	0.003 mg/kg (dw)	
		Air	< 0.0001 mg/m³	
		Agricultural soil	0.003 mg/kg (dw)	< 0.01
	Local PEC	Fresh water	0.333 mg/l	0.37 Municipal STP
		Fresh water sediment	2.778 mg/kg (dw)	0.789 Municipal STP
		STP	2.982 mg/l	0.058 Municipal STP
		Agricultural soil	0.231 mg/kg (dw)	0.021 Municipal STP
	Regional PEC	Fresh water	0.004 mg/l	< 0.01
		Fresh water sediment	0.029 mg/kg (dw)	< 0.01
		Marine water	< 0.0004 mg/l	
		Marine sediment	0.003 mg/kg (dw)	
		Air	< 0.0001 mg/m³	
		Agricultural soil	0.003 mg/kg (dw)	< 0.01

Human Health

Contributing Scenario	Specific conditions	Value type	Level of Exposure	RCR
PROC2		Worker - inhalative, long-term - systemic	0.1 mg/m³	0.032
		Worker - inhalative, short-term - local	0.4 mg/m³	0.078
PROC3		Worker - inhalative, long-term - systemic	0.01 mg/m³	0.003
		Worker - inhalative, short-term - local	0.04 mg/m³	0.008
PROC5		Worker - inhalative, long-term - systemic	0.25 mg/m³	0.081
		Worker - inhalative, short-term - local	1 mg/m³	0.196

PROC8a		Worker - inhalative, long-term - systemic	0.5 mg/m³	0.161
		Worker - inhalative, short-term - local	2 mg/m³	0.392
PROC8b		Worker - inhalative, long-term - systemic	0.125 mg/m³	0.04
		Worker - inhalative, short-term - local	0.5 mg/m³	0.098
PROC9		Worker - inhalative, long-term - systemic	0.2 mg/m³	0.065
		Worker - inhalative, short-term - local	0.8 mg/m³	0.157

RCR = Risk characterisation ratio

ERC2 Exposure Assessment Method : Used EUSES model.

PROC2 Exposure Assessment Method : ECETOC TRA v3.0 worker
PROC3
PROC5
PROC8a
PROC8b
PROC9

3.4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

3.4.1 Environment

If a DU has OC/RMMs outside specifications in the ES, then the DU can evaluate whether he works inside the boundaries set by the ES through scaling in EUSES.
The main driving parameters are :
- local amount used (tonnage)
- release factor prior to on-site treatment
- on-site wastewater treatment presence and efficiency
- dilution factor,Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

3.4.2 Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented., Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4. ES4 : Industrial use, soldering, welding, brazing

4.1. Scenario description

Main User Groups	:	**SU 3**	Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	:	**SU17**	General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment
Environmental release category	:	**ERC5**	Industrial use resulting in inclusion into or onto a matrix
Process category	:	**PROC7**	Industrial spraying
		PROC10	Roller application or brushing
		PROC13	Treatment of articles by dipping and pouring
		PROC24	High (mechanical) energy work-up of substances bound in materials and/ or articles
Product category	:	**PC38**	Welding and soldering products (with flux coatings or flux cores.), flux products

4.2. Conditions of use affecting exposure

4.2.1 Contributing scenario controlling environmental exposure for: ERC5 Industrial use resulting in inclusion into or onto a matrix, Onsite STP

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).

Amount

Maximal annual amount used	:	15 t
Maximum daily site tonnage (kg/day):	:	150 kg
Local daily emission to waste water	:	15.55 kg
Maximum daily local emission to air	:	11 kg
Local daily emission to soil	:	1.5 kg

Environmental factors

Flow rate	:	18,000 m3/d
Dilution Factor (River)	:	20

Other given operational conditions affecting environmental exposure

Number of emission days per year	:	100

Conditions and measures related to sewage treatment plant

Type of Sewage Treatment Plant	:	Onsite STP
Flow rate of sewage treatment plant effluent	:	2,000 m3/d

Conditions and measures related to external treatment of waste for disposal

Waste treatment	:	Neutralisation of the effluents before releases should be considered.

4.2.2 Contributing scenario controlling environmental exposure for: ERC5 Industrial use resulting in inclusion into or onto a matrix, Municipal STP

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).

Amount

Maximum daily site tonnage (kg/day):	:	15 kg
Maximal annual amount used	:	3 t

Environmental factors

Flow rate	:	18,000 m3/d

Other given operational conditions affecting environmental exposure

Number of emission days per year	:	100

Conditions and measures related to sewage treatment plant

Type of Sewage Treatment Plant	:	Municipal STP
Flow rate of sewage treatment plant effluent	:	2,000 m3/d

4.2.3 Contributing scenario controlling worker exposure for: PROC7 Industrial spraying

Product characteristics

Concentration of the Substance in Mixture/Article		Covers the percentage of the substance in the product up to 35 %
Physical Form (at time of use)	:	liquid

Frequency and duration of use

Exposure duration (far field)	:	240 min

Other operational conditions affecting workers exposure

Outdoor / Indoor	:	Indoor
Room size	:	300 m3
Ventilation rate per hour	:	1
Remarks	:	Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures
with local exhaust ventilation

Conditions and measures related to personal protection, hygiene and health evaluation
Wear a full face respirator conforming to EN136 with Type A/P2 filter or better., Use suitable eye protection., Wear suitable gloves tested to EN374., Wear suitable working clothes.

4.2.4 Contributing scenario controlling worker exposure for: PROC10 Roller application or brushing , PROC13 Treatment of articles by dipping and pouring

Product characteristics

Concentration of the Substance in Mixture/Article		Covers the percentage of the substance in the product up to 35 %
Physical Form (at time of use)	:	liquid

Frequency and duration of use

Exposure duration (near field)	:	240 min

Other operational conditions affecting workers exposure

Outdoor / Indoor	:	Indoor
Room size	:	300 m3
Ventilation rate per hour	:	1
Remarks	:	Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

with local exhaust ventilation

Conditions and measures related to personal protection, hygiene and health evaluation

Use suitable eye protection., Wear suitable gloves tested to EN374.

4.2.5 Contributing scenario controlling worker exposure for: PROC24 High (mechanical) energy work-up of substances bound in materials and/ or articles

Product characteristics

Concentration of the Substance in Mixture/Article		Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Solid mixture

Frequency and duration of use

Exposure duration	:	< 8 h

Other operational conditions affecting workers exposure

Outdoor / Indoor	:	Indoor
Remarks	:	> melting point

Technical conditions and measures

Provide a basic standard of general ventilation (1 to 3 air changes per hour) .
Local exhaust ventilation - efficiency of at least (Effectiveness (of a measure): 80 %)

Conditions and measures related to personal protection, hygiene and health evaluation

Wear a respirator conforming to EN141 with Type A/P2 filter or better.
Use suitable eye protection., Wear suitable gloves tested to EN374.

4.3. Exposure estimation and reference to its source

Environment

Release factor	Value type	Compartment	Environmental exposure	RCR
ERC5	Local PEC	Fresh water	0.4 mg/l	0.444 Onsite STP
		Fresh water sediment	3.33 mg/kg (dw)	0.946 Onsite STP
		STP	0 mg/l	< 0.01 Onsite STP
		Agricultural soil	0.006 mg/kg (dw)	< 0.01 Onsite STP
	Regional PEC	Fresh water	0.004 mg/l	< 0.01
		Fresh water sediment	0.029 mg/kg (dw)	< 0.01
		Marine water	< 0.0004 mg/l	
		Marine sediment	0.003 mg/kg (dw)	
		Air	< 0.0001 mg/m³	
		Agricultural soil	0.003 mg/kg (dw)	< 0.01
	Local PEC	Fresh water	0.408 mg/l	0.453 Municipal STP
		Fresh water sediment	3.4 mg/kg (dw)	0.966 Municipal STP
		STP	3.728 mg/l	0.073 Municipal STP
		Agricultural soil	0.274 mg/kg (dw)	0.025 Municipal STP
	Regional PEC	Fresh water	0.004 mg/l	< 0.01
		Fresh water sediment	0.029 mg/kg (dw)	< 0.01
		Marine water	< 0.0004 mg/l	
		Marine sediment	0.003 mg/kg (dw)	
		Air	< 0.0001 mg/m³	
		Agricultural soil	0.003 mg/kg (dw)	< 0.01

Human Health

Contributing Scenario	Specific conditions	Value type	Level of Exposure	RCR
PROC7		Inhalation - Long-term - systemic effects	0.65 mg/m³	0.21
		Inhalation - Acute - local effects	2.6 mg/m³	0.51
PROC10		Inhalation - Long-term - systemic effects	0.4 mg/m³	0.13
		Inhalation - Acute - local effects	1.6 mg/m³	0.31
PROC13		Inhalation - Long-term - systemic effects	0.004 mg/m³	0.0013
		Inhalation - Acute - local effects	0.016 mg/m³	0.0031
PROC24		Worker - inhalative, long-term - systemic	0.2 mg/m³	0.065
		Worker - inhalative, short-term -	0.8 mg/m³	0.157

		local		

RCR = Risk characterisation ratio

ERC5	Exposure Assessment Method : Used EUSES model.
PROC7 PROC10 PROC13 PROC24	Exposure Assessment Method : ART 1.0 Exposure Assessment Method : ECETOC TRA v3.0 worker

4.4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

4.4.1 Environment
If a DU has OC/RMMs outside specifications in the ES, then the DU can evaluate whether he works inside the boundaries set by the ES through scaling in EUSES.
The main driving parameters are :
- local amount used (tonnage)
- release factor prior to on-site treatment
- on-site wastewater treatment presence and efficiency
- dilution factor,Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.4.2 Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented., Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

5. ES5 : Industrial use, soldering, welding, brazing

5.1. Scenario description

Main User Groups	:	**SU 3**	Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	:	**SU17**	General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment
Environmental release category	:	**ERC4**	Industrial use of processing aids in processes and products, not becoming part of articles
Process category	:	**PROC22**	Potentially closed processing operations with minerals/ metals at elevated temperature; Industrial setting
		PROC25	Other hot work operations with metals
Product category	:	**PC38**	Welding and soldering products (with flux coatings or flux cores.), flux products

5.2. Conditions of use affecting exposure

5.2.1 Contributing scenario controlling environmental exposure for: ERC4 Industrial use of processing aids in processes and products, not becoming part of articles, Onsite STP

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).

Amount

Maximal annual amount used	:	15 t
Maximum daily site tonnage (kg/day):	:	150 kg
Local daily emission to waste water	:	15.55 kg
Maximum daily local emission to air	:	11 kg
Local daily emission to soil	:	7.5 kg

Environmental factors

Flow rate	:	18,000 m3/d
Dilution Factor (River)	:	20

Other given operational conditions affecting environmental exposure

Number of emission days per year	:	100

Conditions and measures related to sewage treatment plant

Type of Sewage Treatment Plant	:	Onsite STP
Flow rate of sewage treatment plant effluent	:	2,000 m3/d

Conditions and measures related to external treatment of waste for disposal

Waste treatment	:	Neutralisation of the effluents before releases should be considered.

5.2.2 Contributing scenario controlling environmental exposure for: ERC4 Industrial use of processing aids in processes and products, not becoming part of articles, Municipal STP

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).

Amount

Maximal annual amount used	:	1.5 t
Maximum daily site tonnage (kg/day):	:	7 kg

Environmental factors

Flow rate	:	18,000 m3/d

Other given operational conditions affecting environmental exposure

Number of emission days per year	:	100

Conditions and measures related to sewage treatment plant

Type of Sewage Treatment Plant	:	Municipal STP
Flow rate of sewage treatment plant effluent	:	2,000 m3/d

5.2.3 Contributing scenario controlling worker exposure for: PROC22 Potentially closed processing operations with minerals/ metals at elevated temperature; Industrial setting

Product characteristics

Concentration of the Substance in Mixture/Article		Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Solid mixture

Frequency and duration of use

Exposure duration	:	< 8 h

Other operational conditions affecting workers exposure

Outdoor / Indoor	:	Indoor
Remarks	:	> melting point

Technical conditions and measures

Provide a basic standard of general ventilation (1 to 3 air changes per hour) .
Local exhaust ventilation - efficiency of at least (Effectiveness (of a measure): 90 %)

Conditions and measures related to personal protection, hygiene and health evaluation

Wear a respirator conforming to EN141 with Type A/P2 filter or better.
Use suitable eye protection., Wear suitable gloves tested to EN374.

5.2.4 Contributing scenario controlling worker exposure for: PROC25 Other hot work operations with metals

Product characteristics

Concentration of the Substance in Mixture/Article		Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Solid mixture

Frequency and duration of use

Exposure duration	:	< 8 h

Other operational conditions affecting workers exposure

Outdoor / Indoor	:	Indoor
Remarks	:	> melting point

Technical conditions and measures

Provide a basic standard of general ventilation (1 to 3 air changes per hour) .
Local exhaust ventilation - efficiency of at least (Effectiveness (of a measure): 90 %)

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374.
Use suitable eye protection.

5.3. Exposure estimation and reference to its source

Environment

Release factor	Value type	Compartment	Environmental exposure	RCR
ERC4	Local PEC	Fresh water	0.4 mg/l	0.444 Onsite STP
		Fresh water sediment	3.33 mg/kg (dw)	0.946 Onsite STP
		STP	0 mg/l	< 0.01 Onsite STP
		Agricultural soil	0.006 mg/kg (dw)	< 0.01 Onsite STP
	Regional PEC	Fresh water	0.004 mg/l	< 0.01
		Fresh water sediment	0.029 mg/kg (dw)	< 0.01
		Marine water	< 0.0004 mg/l	
		Marine sediment	0.003 mg/kg (dw)	
		Air	< 0.0001 mg/m³	
		Agricultural soil	0.003 mg/kg (dw)	< 0.01
	Local PEC	Fresh water	0.383 mg/l	0.426 Municipal STP
		Fresh water sediment	3.193 mg/kg (dw)	0.907 Municipal STP
		STP	3.479 mg/l	0.068 Municipal STP
		Agricultural soil	0.26 mg/kg (dw)	0.024 Municipal STP
	Regional PEC	Fresh water	0.004 mg/l	< 0.01
		Fresh water sediment	0.029 mg/kg (dw)	< 0.01
		Marine water	< 0.0004 mg/l	
		Marine sediment	0.003 mg/kg (dw)	
		Air	< 0.0001 mg/m³	
		Agricultural soil	0.003 mg/kg (dw)	< 0.01

Human Health

Contributing Scenario	Specific conditions	Value type	Level of Exposure	RCR
PROC22		Worker - inhalative, long-term - systemic	0.1 mg/m³	0.032
		Worker - inhalative, short-term - local	0.4 mg/m³	0.078
PROC25		Worker - inhalative, long-term - systemic	0.5 mg/m³	0.161
		Worker - inhalative, short-term - local	2 mg/m³	0.392

RCR = Risk characterisation ratio

ERC4 Exposure Assessment Method : Used EUSES model.

PROC22 PROC25	Exposure Assessment Method : ECETOC TRA v3.0 worker

5.4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

5.4.1 Environment
If a DU has OC/RMMs outside specifications in the ES, then the DU can evaluate whether he works inside the boundaries set by the ES through scaling in EUSES.
The main driving parameters are :
- local amount used (tonnage)
- release factor prior to on-site treatment
- on-site wastewater treatment presence and efficiency
- dilution factor,Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

5.4.2 Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented., Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

6. ES6 : Non-metal-surface treatment products

6.1. Scenario description

Main User Groups	:	**SU 3**	Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	:	**SU17**	General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment
Environmental release category	:	**ERC6b**	Industrial use of reactive processing aids
Process category	:	**PROC7**	Industrial spraying
		PROC13	Treatment of articles by dipping and pouring
Product category	:	**PC15**	Non-metal-surface treatment products

6.2. Conditions of use affecting exposure

6.2.1 Contributing scenario controlling environmental exposure for: ERC6b Industrial use of reactive processing aids

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).

Amount

Maximum daily site tonnage (kg/day):	:	55 kg
Maximal annual amount used	:	20 t
Local daily emission to waste water	:	2.75 kg
Maximum daily local emission to air	:	0.055 kg
Local daily emission to soil	:	13.75 g

Environmental factors

Flow rate	:	18,000 m3/d

Other given operational conditions affecting environmental exposure

Number of emission days per year	:	365

Conditions and measures related to sewage treatment plant

Type of Sewage Treatment Plant	:	Onsite STP
Flow rate of sewage treatment plant effluent	:	2,000 m3/d

Conditions and measures related to external treatment of waste for disposal

Waste treatment	:	Neutralisation of the effluents before releases should be considered.

6.2.2 Contributing scenario controlling worker exposure for: PROC7 Industrial spraying

Product characteristics

Concentration of the Substance in Mixture/Article		Covers the percentage of the substance in the product up to 40%
Physical Form (at time of use)	:	liquid

Frequency and duration of use

Exposure duration (far field)	:	240 min

Other operational conditions affecting workers exposure

Outdoor / Indoor	:	Indoor
Room size	:	300 m3
Ventilation rate per hour	:	1
Remarks	:	Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures
with local exhaust ventilation

Conditions and measures related to personal protection, hygiene and health evaluation
Wear a full face respirator conforming to EN136 with Type A/P2 filter or better., Use suitable eye protection., Wear suitable gloves tested to EN374.

6.2.3 Contributing scenario controlling worker exposure for: PROC13 Treatment of articles by dipping and pouring

Product characteristics

Concentration of the Substance in Mixture/Article		Covers the percentage of the substance in the product up to 40%
Physical Form (at time of use)	:	liquid

Frequency and duration of use

Exposure duration (near field)	:	240 min

Other operational conditions affecting workers exposure

Outdoor / Indoor	:	Indoor
Room size	:	300 m3
Ventilation rate per hour	:	1
Remarks	:	Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures
with local exhaust ventilation

Conditions and measures related to personal protection, hygiene and health evaluation
Use suitable eye protection., Wear suitable gloves tested to EN374.

6.3. Exposure estimation and reference to its source

Environment

Release factor	Value type	Compartment	Environmental exposure	RCR
ERC6b	Local PEC	Fresh water	0.141 mg/l	0.157
		Fresh water sediment	1.176 mg/kg (dw)	0.334
		STP	0 mg/l	< 0.01
		Agricultural soil	0.003 mg/kg (dw)	< 0.01
	Regional PEC	Fresh water	0.004 mg/l	< 0.01
		Fresh water sediment	0.029 mg/kg (dw)	< 0.01
		Marine water	< 0.0004 mg/l	
		Marine sediment	0.003 mg/kg (dw)	
		Air	< 0.0001 mg/m³	
		Agricultural soil	0.003 mg/kg (dw)	< 0.01

Human Health

Contributing Scenario	Specific conditions	Value type	Level of Exposure	RCR
PROC7		Inhalation - Long-term - systemic effects	0.75 mg/m³	0.24
		Inhalation - Acute - local effects	3 mg/m³	0.59
PROC13		Inhalation - Long-term - systemic effects	0.0046 mg/m³	0.0015
		Inhalation - Acute - local effects	0.018 mg/m³	0.0036

RCR = Risk characterisation ratio

ERC6b Exposure Assessment Method : Used EUSES model.
PROC7 Exposure Assessment Method : ART 1.0
PROC13

6.4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

6.4.1 Environment
If a DU has OC/RMMs outside specifications in the ES, then the DU can evaluate whether he works inside the boundaries set by the ES through scaling in EUSES.
The main driving parameters are :
- local amount used (tonnage)
- release factor prior to on-site treatment
- on-site wastewater treatment presence and efficiency
- dilution factor,Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

6.4.2 Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational

Conditions outlined in Section 2 are implemented., Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

7. ES7 : Metal surface treatment products, including galvanic and electroplating products

7.1. Scenario description

Main User Groups	:	**SU 3**	Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	:	**SU17**	General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment
Environmental release category	:	**ERC6b**	Industrial use of reactive processing aids
Process category	:	**PROC7**	Industrial spraying
		PROC13	Treatment of articles by dipping and pouring
Product category	:	**PC14**	Metal surface treatment products, including galvanic and electroplating products

7.2. Conditions of use affecting exposure

7.2.1 Contributing scenario controlling environmental exposure for: ERC6b Industrial use of reactive processing aids, Onsite STP

Amount

Maximal annual amount used	:	30 t
Maximum daily site tonnage (kg/day):	:	300 kg
Local daily emission to waste water	:	15 kg
Maximum daily local emission to air	:	0.3 kg
Local daily emission to soil	:	0.075 kg

Environmental factors

Flow rate	:	18,000 m3/d
Dilution Factor (River)	:	20

Other given operational conditions affecting environmental exposure

Number of emission days per year	:	100

Conditions and measures related to sewage treatment plant

Type of Sewage Treatment Plant	:	Onsite STP
Flow rate of sewage treatment plant effluent	:	2,000 m3/d

Conditions and measures related to external treatment of waste for disposal

Waste treatment	:	Neutralisation of the effluents before releases should be considered.

7.2.2 Contributing scenario controlling environmental exposure for: ERC6b Industrial use of reactive processing aids, Municipal STP

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).

Amount

Maximal annual amount used	:	50 t
Maximum daily site tonnage (kg/day):	:	150 kg

Environmental factors

Flow rate	:	18,000 m3/d

Other given operational conditions affecting environmental exposure

Number of emission days per year	:	100

Conditions and measures related to sewage treatment plant

Type of Sewage Treatment Plant	:	Municipal STP
Flow rate of sewage treatment plant effluent	:	2,000 m3/d

7.2.3 Contributing scenario controlling worker exposure for: PROC7 Industrial spraying

Product characteristics

Concentration of the Substance in Mixture/Article		Covers the percentage of the substance in the product up to 40%
Physical Form (at time of use)	:	liquid

Frequency and duration of use

Exposure duration (far field)	:	240 min

Other operational conditions affecting workers exposure

Outdoor / Indoor	:	Indoor
Room size	:	300 m3
Ventilation rate per hour	:	1
Remarks	:	Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

with local exhaust ventilation

Conditions and measures related to personal protection, hygiene and health evaluation

Wear a full face respirator conforming to EN136 with Type A/P2 filter or better., Use suitable eye protection., Wear suitable gloves tested to EN374., Wear suitable working clothes.

7.2.4 Contributing scenario controlling worker exposure for: PROC13 Treatment of articles by dipping and pouring

Product characteristics

Concentration of the Substance in Mixture/Article		Covers the percentage of the substance in the product up to 40%
Physical Form (at time of use)	:	liquid

Frequency and duration of use

Exposure duration (near field)	:	240 min

Other operational conditions affecting workers exposure

Outdoor / Indoor	:	Indoor
Room size	:	300 m3

Ventilation rate per hour	:	1
Remarks	:	Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures
with local exhaust ventilation

Conditions and measures related to personal protection, hygiene and health evaluation
Use suitable eye protection., Wear suitable gloves tested to EN374., Wear suitable working clothes.

7.3. Exposure estimation and reference to its source

Environment

Release factor	Value type	Compartment	Environmental exposure	RCR
ERC6b	Local PEC	Fresh water	0.4 mg/l	0.444 Onsite STP
		Fresh water sediment	3.33 mg/kg (dw)	0.946 Onsite STP
		STP	0 mg/l	< 0.01 Onsite STP
		Agricultural soil	0.003 mg/kg (dw)	< 0.01 Onsite STP
	Regional PEC	Fresh water	0.004 mg/l	< 0.01
		Fresh water sediment	0.029 mg/kg (dw)	< 0.01
		Marine water	< 0.0004 mg/l	
		Marine sediment	0.003 mg/kg (dw)	
		Air	< 0.0001 mg/m³	
		Agricultural soil	0.003 mg/kg (dw)	< 0.01
	Local PEC	Fresh water	0.408 mg/l	0.453 Municipal STP
		Fresh water sediment	3.4 mg/kg (dw)	0.966 Municipal STP
		STP	3.728 mg/l	0.073 Municipal STP
		Agricultural soil	0.27 mg/kg (dw)	0.025 Municipal STP
	Regional PEC	Fresh water	0.004 mg/l	< 0.01
		Fresh water sediment	0.029 mg/kg (dw)	< 0.01
		Marine water	< 0.0004 mg/l	
		Marine sediment	0.003 mg/kg (dw)	
		Air	< 0.0001 mg/m³	
		Agricultural soil	0.003 mg/kg (dw)	< 0.01

Human Health

Contributing Scenario	Specific conditions	Value type	Level of Exposure	RCR
PROC7		Inhalation - Long-term - systemic effects	0.75 mg/m³	0.24
		Inhalation - Acute - local effects	3 mg/m³	0.59
PROC13		Inhalation - Long-term - systemic effects	0.0046 mg/m³	0.0015
		Inhalation - Acute - local effects	0.0018 mg/m³	0.0036

RCR = Risk characterisation ratio

ERC6b Exposure Assessment Method : Used EUSES model.

PROC7 Exposure Assessment Method : ART 1.0

PROC13

7.4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

7.4.1 Environment
If a DU has OC/RMMs outside specifications in the ES, then the DU can evaluate whether he works inside the boundaries set by the ES through scaling in EUSES.
The main driving parameters are :
- local amount used (tonnage)
- release factor prior to on-site treatment
- on-site wastewater treatment presence and efficiency
- dilution factor,Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

7.4.2 Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented., Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

8. ES8 : Production of optical glass

8.1. Scenario description

Main User Groups	:	**SU 3**	Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category	:	**ERC5**	Industrial use resulting in inclusion into or onto a matrix
Process category	:	**PROC23**	Open processing and transfer operations with minerals/ metals at elevated temperature
Product category	:		ceramic Specialised optical glass.

8.2. Conditions of use affecting exposure

8.2.1 Contributing scenario controlling environmental exposure for: ERC5 Industrial use resulting in inclusion into or onto a matrix, Onsite STP

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).

Amount

Maximal annual amount used	:	50 t
Maximum daily site tonnage (kg/day):	:	500 kg
Local daily emission to waste water	:	15.55 kg
Maximum daily local emission to air	:	11 kg
Local daily emission to soil	:	5 kg

Environmental factors

Flow rate	:	18,000 m3/d
Dilution Factor (River)	:	20

Other given operational conditions affecting environmental exposure

Number of emission days per year	:	100

Conditions and measures related to sewage treatment plant

Type of Sewage Treatment Plant	:	Onsite STP
Flow rate of sewage treatment plant effluent	:	2,000 m3/d

Conditions and measures related to external treatment of waste for disposal

Waste treatment	:	Neutralisation of the effluents before releases should be considered.

8.2.2 Contributing scenario controlling environmental exposure for: ERC5 Industrial use resulting in inclusion into or onto a matrix, Municipal STP

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).

Amount

Maximum daily site tonnage (kg/day):	:	15 kg
Maximal annual amount used	:	3 t

Environmental factors

Flow rate	:	18,000 m3/d

Other given operational conditions affecting environmental exposure

Number of emission days per year	:	100

Conditions and measures related to sewage treatment plant

Type of Sewage Treatment Plant	:	Municipal STP
Flow rate of sewage treatment plant effluent	:	2,000 m3/d

8.2.3 Contributing scenario controlling worker exposure for: PROC23 Open processing and transfer operations with minerals/ metals at elevated temperature

Product characteristics

Concentration of the Substance in Mixture/Article		Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Solid mixture

Frequency and duration of use

Exposure duration	:	< 8 h

Other operational conditions affecting workers exposure

Outdoor / Indoor	:	Indoor
Remarks	:	> melting point

Technical conditions and measures

Provide a basic standard of general ventilation (1 to 3 air changes per hour) .
Local exhaust ventilation - efficiency of at least (Effectiveness (of a measure): 90 %)

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374., Wear a respirator conforming to EN141 with Type A/P2 filter or better.
Use suitable eye protection.

8.3. Exposure estimation and reference to its source

Environment

Release factor	Value type	Compartment	Environmental exposure	RCR
ERC5	Local PEC	Fresh water	0.4 mg/l	0.444 Onsite STP
		Fresh water sediment	3.33 mg/kg (dw)	0.946 Onsite STP
		STP	0 mg/l	< 0.01 Onsite STP
		Agricultural soil	0.006 mg/kg (dw)	< 0.01 Onsite STP
	Regional PEC	Fresh water	0.004 mg/l	< 0.01
		Fresh water sediment	0.029 mg/kg (dw)	< 0.01
		Marine water	< 0.0004 mg/l	
		Marine sediment	0.003 mg/kg (dw)	
		Air	< 0.0001 mg/m³	
		Agricultural soil	0.003 mg/kg (dw)	< 0.01
	Local PEC	Fresh water	0.408 mg/l	0.453 Municipal STP
		Fresh water sediment	3.4 mg/kg (dw)	0.966 Municipal STP
		STP	3.728 mg/l	0.073 Municipal STP
		Agricultural soil	0.274 mg/kg (dw)	0.025 Municipal STP
	Regional PEC	Fresh water	0.004 mg/l	< 0.01
		Fresh water sediment	0.029 mg/kg (dw)	< 0.01
		Marine water	< 0.0004 mg/l	
		Marine sediment	0.003 mg/kg (dw)	
		Air	< 0.0001 mg/m³	
		Agricultural soil	0.003 mg/kg (dw)	< 0.01

Human Health

Contributing Scenario	Specific conditions	Value type	Level of Exposure	RCR
PROC23		Worker - inhalative, long-term - systemic	0.1 mg/m³	0.032
		Worker - inhalative, short-term - local	0.4 mg/m³	0.078

RCR = Risk characterisation ratio

ERC5 Exposure Assessment Method : Used EUSES model.

PROC23 Exposure Assessment Method : Used ECETOC TRA model.

8.4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

8.4.1 Environment

If a DU has OC/RMMs outside specifications in the ES, then the DU can evaluate whether he works inside the boundaries set by the ES through scaling in EUSES.
The main driving parameters are :
- local amount used (tonnage)
- release factor prior to on-site treatment
- on-site wastewater treatment presence and efficiency
- dilution factor,Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

8.4.2 Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented., Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

9. ES9 : Use as wood preservative in industrial environment

9.1. Scenario description

Main User Groups	:	**SU 3**	Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	:	**SU6a**	Manufacture of wood and wood products
Environmental release category	:	**ERC6b**	Industrial use of reactive processing aids
Process category	:	**PROC13**	Treatment of articles by dipping and pouring

9.2. Conditions of use affecting exposure

9.2.1 Contributing scenario controlling environmental exposure for: ERC6b Industrial use of reactive processing aids

Amount

Maximal annual amount used	:	10 t
Maximum daily site tonnage (kg/day):	:	27 kg
Local daily emission to waste water	:	1.37 kg
Maximum daily local emission to air	:	0.027 kg
Local daily emission to soil	:	6.75 g

Environmental factors

Flow rate	:	18,000 m3/d

Other given operational conditions affecting environmental exposure

Number of emission days per year	:	365

Conditions and measures related to sewage treatment plant

Type of Sewage Treatment Plant	:	Onsite STP
Flow rate of sewage treatment plant effluent	:	2,000 m3/d

Conditions and measures related to external treatment of waste for disposal

Waste treatment	:	Neutralisation of the effluents before releases should be considered.

9.2.2 Contributing scenario controlling worker exposure for: PROC13 Treatment of articles by dipping and pouring , OC8 Indoor

Product characteristics

Concentration of the Substance in Mixture/Article		Covers the percentage of the substance in the product up to 20%
Physical Form (at time of use)	:	liquid

Frequency and duration of use

Exposure duration (near field)	:	240 min

Other operational conditions affecting workers exposure

Outdoor / Indoor	:	Indoor
Room size	:	300 m3
Ventilation rate per hour	:	1

Remarks	:	Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures
with local exhaust ventilation

Conditions and measures related to personal protection, hygiene and health evaluation
Use suitable eye protection., Wear suitable gloves tested to EN374., Wear suitable working clothes.

9.2.3 Contributing scenario controlling worker exposure for: PROC13 Treatment of articles by dipping and pouring , OC9 Outdoor

Product characteristics

Concentration of the Substance in Mixture/Article		Covers the percentage of the substance in the product up to 40%
Physical Form (at time of use)	:	liquid

Frequency and duration of use

Exposure duration (near field)	:	240 min

Other operational conditions affecting workers exposure

Outdoor / Indoor	:	Outdoor
Remarks	:	Assumes activities are at ambient temperature (unless stated differently).

Conditions and measures related to personal protection, hygiene and health evaluation
Use suitable eye protection., Wear suitable working clothes., Wear suitable gloves tested to EN374.

9.3. Exposure estimation and reference to its source

Environment

Release factor	Value type	Compartment	Environmental exposure	RCR
ERC6b	Local PEC	Fresh water	0.072 mg/l	0.08
		Fresh water sediment	0.601 mg/kg (dw)	0.171
		STP	0 mg/l	< 0.01
		Agricultural soil	0.003 mg/kg (dw)	< 0.01
	Regional PEC	Fresh water	0.004 mg/l	< 0.01
		Fresh water sediment	0.029 mg/kg (dw)	< 0.01
		Marine water	< 0.0004 mg/l	
		Marine sediment	0.003 mg/kg (dw)	
		Air	< 0.0001 mg/m³	
		Agricultural soil	0.003 mg/kg (dw)	< 0.01

Human Health

Contributing Scenario	Specific conditions	Value type	Level of Exposure	RCR
PROC13	Indoor	Inhalation - Long-term - systemic effects	0.0023 mg/m³	0.00074
		Inhalation - Acute - local effects	0.0093 mg/m³	0.0018
	Outdoor	Inhalation - Long-term - systemic effects	0.0059 mg/m³	0.0019
		Inhalation - Acute - local effects	0.024 mg/m³	0.0046

RCR = Risk characterisation ratio

ERC6b Exposure Assessment Method : Used EUSES model.
PROC13 Exposure Assessment Method : ART 1.0

9.4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

9.4.1 Environment
If a DU has OC/RMMs outside specifications in the ES, then the DU can evaluate whether he works inside the boundaries set by the ES through scaling in EUSES.
The main driving parameters are :
- local amount used (tonnage)
- release factor prior to on-site treatment
- on-site wastewater treatment presence and efficiency
- dilution factor,Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

9.4.2 Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented., Where other Risk Management Measures/Operational

Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

10. ES10 : Professional use as soldering/brazing material, Indoor

10.1. Scenario description

Main User Groups	:	**SU 22**	Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category	:	**ERC8b**	Wide dispersive indoor use of reactive substances in open systems
Process category	:	**PROC10**	Roller application or brushing
		PROC13	Treatment of articles by dipping and pouring
		PROC25	Other hot work operations with metals
Product category	:	**PC38**	Welding and soldering products (with flux coatings or flux cores.), flux products

10.2. Conditions of use affecting exposure

10.2.1 Contributing scenario controlling environmental exposure for: ERC8b Wide dispersive indoor use of reactive substances in open systems

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).

Amount

Local daily emission to waste water	:	0.33 g
Maximum daily local emission to air	:	0.0165 g
Local daily emission to soil	:	0 kg
Daily amount for wide disperse uses	:	16.5 g

Environmental factors

Flow rate	:	18,000 m3/d

Conditions and measures related to sewage treatment plant

Type of Sewage Treatment Plant	:	Municipal STP
Flow rate of sewage treatment plant effluent	:	2,000 m3/d
Effectiveness (of a measure)	:	0.6 %

10.2.2 Contributing scenario controlling worker exposure for: PROC10 Roller application or brushing , PROC13 Treatment of articles by dipping and pouring

Product characteristics

Concentration of the Substance in Mixture/Article		Covers the percentage of the substance in the product up to 35 %
Physical Form (at time of use)	:	liquid

Frequency and duration of use

Exposure duration (near field)	:	240 min

Other operational conditions affecting workers exposure

Outdoor / Indoor	:	Indoor

Room size	:	300 m3
Ventilation rate per hour	:	1
Remarks	:	Assumes activities are at ambient temperature (unless stated differently).

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable working clothes., Use suitable eye protection., Wear suitable gloves tested to EN374.

10.2.3 Contributing scenario controlling worker exposure for: PROC25 Other hot work operations with metals

Product characteristics

Concentration of the Substance in Mixture/Article		Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Solid mixture

Frequency and duration of use

Exposure duration	:	< 8 h

Other operational conditions affecting workers exposure

Outdoor / Indoor	:	Indoor
Remarks	:	> melting point

Technical conditions and measures
Provide a basic standard of general ventilation (1 to 3 air changes per hour) .

Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator conforming to EN141 with Type A/P2 filter or better., Use suitable eye protection., Wear suitable gloves tested to EN374.

10.3. Exposure estimation and reference to its source

Environment

Release factor	Value type	Compartment	Environmental exposure	RCR
ERC8b	Local PEC	Fresh water	0.004 mg/l	< 0.01
		Fresh water sediment	0.03 mg/kg (dw)	< 0.01
		STP	< 0.001 mg/l	< 0.01
		Agricultural soil	0.003 mg/kg (dw)	< 0.01
	Regional PEC	Fresh water	0.004 mg/l	< 0.01
		Fresh water sediment	0.029 mg/kg (dw)	< 0.01
		Marine water	< 0.0004 mg/l	
		Marine sediment	0.003 mg/kg (dw)	
		Air	< 0.0001 mg/m³	
		Agricultural soil	0.003 mg/kg (dw)	< 0.01

Human Health

Contributing Scenario	Specific conditions	Value type	Level of Exposure	RCR
PROC10		Inhalation - Long-term - systemic effects	0.8 mg/m³	0.26
		Inhalation - Acute - local effects	3.2 mg/m³	0.63
PROC13		Inhalation - Long-term - systemic effects	0.008 mg/m³	0.0026
		Inhalation - Acute - local effects	0.032 mg/m³	0.0063
PROC25		Worker - inhalative, long-term - systemic	1 mg/m³	0.323
		Worker - inhalative, short-term - local	4 mg/m³	0.784

RCR = Risk characterisation ratio

ERC8b Exposure Assessment Method : Used EUSES model.
PROC10 Exposure Assessment Method : ART 1.0
PROC13 Exposure Assessment Method : ART 1.0
PROC25 Exposure Assessment Method : ECETOC TRA v3.0 worker

10.4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

10.4.1 Environment
If a DU has OC/RMMs outside specifications in the ES, then the DU can evaluate whether he works inside the boundaries set by the ES through scaling in EUSES.
The main driving parameters are :
- local amount used (tonnage)
- release factor prior to on-site treatment
- on-site wastewater treatment presence and efficiency
- dilution factor,Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either

alone or in combination.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

10.4.2 Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented., Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

11. ES11 : Professional use as soldering/brazing material, Outdoor

11.1. Scenario description

Main User Groups	:	**SU 22**	Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Sectors of end-use	:	**SU17**	General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment
Environmental release category	:	**ERC8e**	Wide dispersive outdoor use of reactive substances in open systems
Process category	:	**PROC10**	Roller application or brushing
		PROC13	Treatment of articles by dipping and pouring
		PROC25	Other hot work operations with metals
Product category	:	**PC38**	Welding and soldering products (with flux coatings or flux cores.), flux products

11.2. Conditions of use affecting exposure

11.2.1 Contributing scenario controlling environmental exposure for: ERC8e Wide dispersive outdoor use of reactive substances in open systems

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).

Amount

Local daily emission to waste water	:	0.33 g
Maximum daily local emission to air	:	0.0165 g
Local daily emission to soil	:	0 g
Daily amount for wide disperse uses	:	16.5 g

Environmental factors

Flow rate	:	18,000 m3/d

Conditions and measures related to sewage treatment plant

Type of Sewage Treatment Plant	:	Municipal STP
Flow rate of sewage treatment plant effluent	:	2,000 m3/d
Effectiveness (of a measure)	:	0.6 %

11.2.2 Contributing scenario controlling worker exposure for: PROC10 Roller application or brushing , PROC13 Treatment of articles by dipping and pouring

Product characteristics

Concentration of the Substance in Mixture/Article		Covers the percentage of the substance in the product up to 35 %
Physical Form (at time of use)	:	liquid

Frequency and duration of use

Exposure duration (near field)	:	240 min

Other operational conditions affecting workers exposure

Outdoor / Indoor	:	Outdoor
Remarks	:	Assumes activities are at ambient temperature (unless stated differently).

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable working clothes., Use suitable eye protection., Wear suitable gloves tested to EN374.

11.2.3 Contributing scenario controlling worker exposure for: PROC25 Other hot work operations with metals

Product characteristics

Concentration of the Substance in Mixture/Article		Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Solid mixture

Frequency and duration of use

Exposure duration	:	< 8 h

Other operational conditions affecting workers exposure

Outdoor / Indoor	:	Outdoor
Remarks	:	> melting point

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374., Wear a respirator conforming to EN141 with Type A/P2 filter or better., Use suitable eye protection.

11.3. Exposure estimation and reference to its source

Environment

Release factor	Value type	Compartment	Environmental exposure	RCR
ERC8e	Local PEC	Fresh water	0.004 mg/l	< 0.01
		Fresh water sediment	0.03 mg/kg (dw)	< 0.01
		STP	< 0.001 mg/l	< 0.01
		Agricultural soil	0.003 mg/kg (dw)	< 0.01
	Regional PEC	Fresh water	0.004 mg/l	< 0.01
		Fresh water sediment	0.029 mg/kg (dw)	< 0.01
		Marine water	< 0.0004 mg/l	
		Marine sediment	0.003 mg/kg (dw)	
		Air	< 0.0001 mg/m³	
		Agricultural soil	0.003 mg/kg (dw)	< 0.01

Human Health

Contributing Scenario	Specific conditions	Value type	Level of Exposure	RCR
PROC10		Inhalation - Long-term - systemic effects	1 mg/m³	0.32
		Inhalation - Acute - local effects	4 mg/m³	0.78
PROC13		Inhalation - Long-term - systemic effects	0.011 mg/m³	0.0036
		Inhalation - Acute - local effects	0.0044 mg/m³	0.0086
PROC25		Worker - inhalative, long-term - systemic	0.7 mg/m³	0.226
		Worker - inhalative, short-term - local	2.8 mg/m³	0.549

RCR = Risk characterisation ratio

ERC8e Exposure Assessment Method : Used EUSES model.
PROC10 Exposure Assessment Method : ART 1.0
PROC13 Exposure Assessment Method : ART 1.0
PROC25 Exposure Assessment Method : ECETOC TRA v3.0 worker

11.4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

11.4.1 Environment
If a DU has OC/RMMs outside specifications in the ES, then the DU can evaluate whether he works inside the boundaries set by the ES through scaling in EUSES.
The main driving parameters are :
- local amount used (tonnage)
- release factor prior to on-site treatment
- on-site wastewater treatment presence and efficiency
- dilution factor,Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either

alone or in combination.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

11.4.2 Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented., Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

12. ES12 : Use as wood preservative for professional use, Indoor

12.1. Scenario description

Main User Groups	:	**SU 22**	Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Sectors of end-use	:	**SU6a**	Manufacture of wood and wood products
Environmental release category	:	**ERC8b**	Wide dispersive indoor use of reactive substances in open systems
Process category	:	**PROC11**	Non industrial spraying

12.2. Conditions of use affecting exposure

12.2.1 Contributing scenario controlling environmental exposure for: ERC8b Wide dispersive indoor use of reactive substances in open systems

Amount

Local daily emission to waste water	:	0.055 g
Maximum daily local emission to air	:	0.00275 g
Local daily emission to soil	:	0 g
Daily amount for wide disperse uses	:	2.75 g

Environmental factors

Flow rate	:	18,000 m3/d

Conditions and measures related to sewage treatment plant

Type of Sewage Treatment Plant	:	Municipal STP
Flow rate of sewage treatment plant effluent	:	2,000 m3/d
Effectiveness (of a measure)	:	0.6 %

12.2.2 Contributing scenario controlling worker exposure for: PROC11 Non industrial spraying , OC8 Indoor

Product characteristics

Concentration of the Substance in Mixture/Article		Covers the percentage of the substance in the product up to 5%.
Physical Form (at time of use)	:	liquid

Frequency and duration of use

Exposure duration (near field)	:	240 min

Other operational conditions affecting workers exposure

Outdoor / Indoor	:	Indoor
Room size	:	300 m3
Ventilation rate per hour	:	1
Remarks	:	Assumes activities are at ambient temperature (unless stated differently).

Conditions and measures related to personal protection, hygiene and health evaluation

Wear a full face respirator conforming to EN136 with Type A/P2 filter or better., Wear suitable working clothes., Use suitable eye protection., Wear suitable gloves tested to EN374.

12.3. Exposure estimation and reference to its source

Environment

Release factor	Value type	Compartment	Environmental exposure	RCR
ERC8b	Local PEC	Fresh water	0.004 mg/l	< 0.01
		Fresh water sediment	0.03 mg/kg (dw)	< 0.01
		STP	< 0.001 mg/l	< 0.01
		Agricultural soil	0.003 mg/kg (dw)	< 0.01
	Regional PEC	Fresh water	0.004 mg/l	< 0.01
		Fresh water sediment	0.029 mg/kg (dw)	< 0.01
		Marine water	< 0.0004 mg/l	
		Marine sediment	0.003 mg/kg (dw)	
		Air	< 0.0001 mg/m³	
		Agricultural soil	0.003 mg/kg (dw)	< 0.01

Human Health

Contributing Scenario	Specific conditions	Value type	Level of Exposure	RCR
PROC11	Indoor	Inhalation - Long-term - systemic effects	0.17 mg/m³	0.05
		Inhalation - Acute - local effects	0.68 mg/m³	0.133

RCR = Risk characterisation ratio

ERC8b Exposure Assessment Method : Used EUSES model.
PROC11 Exposure Assessment Method : ART 1.0

12.4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

12.4.1 Environment
If a DU has OC/RMMs outside specifications in the ES, then the DU can evaluate whether he works inside the boundaries set by the ES through scaling in EUSES.
The main driving parameters are :
- local amount used (tonnage)
- release factor prior to on-site treatment
- on-site wastewater treatment presence and efficiency
- dilution factor,Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

12.4.2 Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented., Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

13. ES13 : Use as wood preservative for professional use, Outdoor

13.1. Scenario description

Main User Groups	:	**SU 22**	Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Sectors of end-use	:	**SU6a**	Manufacture of wood and wood products
Environmental release category	:	**ERC8e**	Wide dispersive outdoor use of reactive substances in open systems
Process category	:	**PROC11**	Non industrial spraying

13.2. Conditions of use affecting exposure

13.2.1 Contributing scenario controlling environmental exposure for: ERC8e Wide dispersive outdoor use of reactive substances in open systems

Amount

Local daily emission to waste water	:	0.055 g
Maximum daily local emission to air	:	0.00275 g
Local daily emission to soil	:	0 g
Daily amount for wide disperse uses	:	2.75 g

Environmental factors

Flow rate	:	18,000 m3/d

Conditions and measures related to sewage treatment plant

Type of Sewage Treatment Plant	:	Municipal STP
Flow rate of sewage treatment plant effluent	:	2,000 m3/d
Effectiveness (of a measure)	:	0.6 %

13.2.2 Contributing scenario controlling worker exposure for: PROC11 Non industrial spraying , OC9 Outdoor

Product characteristics

Concentration of the Substance in Mixture/Article		Covers the percentage of the substance in the product up to 5%.
Physical Form (at time of use)	:	liquid

Frequency and duration of use

Exposure duration (near field)	:	240 min

Other operational conditions affecting workers exposure

Outdoor / Indoor	:	Outdoor
Remarks	:	Assumes activities are at ambient temperature (unless stated differently).

Conditions and measures related to personal protection, hygiene and health evaluation

Wear a full face respirator conforming to EN136 with Type A/P2 filter or better., Wear suitable working clothes., Use suitable eye protection., Wear suitable gloves tested to EN374.

13.3. Exposure estimation and reference to its source

Environment

Release factor	Value type	Compartment	Environmental exposure	RCR
ERC8e	Local PEC	Fresh water	0.004 mg/l	< 0.01
		Fresh water sediment	0.03 mg/kg (dw)	< 0.01
		STP	< 0.001 mg/l	< 0.01
		Agricultural soil	0.003 mg/kg (dw)	< 0.01
	Regional PEC	Fresh water	0.004 mg/l	< 0.01
		Fresh water sediment	0.029 mg/kg (dw)	< 0.01
		Marine water	< 0.0004 mg/l	
		Marine sediment	0.003 mg/kg (dw)	
		Air	< 0.0001 mg/m³	
		Agricultural soil	0.003 mg/kg (dw)	< 0.01

Human Health

Contributing Scenario	Specific conditions	Value type	Level of Exposure	RCR
PROC11	Outdoor	Inhalation - Long-term - systemic effects	0.225 mg/m³	0.073
		Inhalation - Acute - local effects	0.9 mg/m³	0.18

RCR = Risk characterisation ratio

ERC8e Exposure Assessment Method : Used EUSES model.
PROC11 Exposure Assessment Method : ART 1.0

13.4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

13.4.1 Environment
If a DU has OC/RMMs outside specifications in the ES, then the DU can evaluate whether he works inside the boundaries set by the ES through scaling in EUSES.
The main driving parameters are :
- local amount used (tonnage)
- release factor prior to on-site treatment
- on-site wastewater treatment presence and efficiency
- dilution factor,Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

13.4.2 Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented., Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

14. ES14 : Laboratory professional use

14.1. Scenario description

Main User Groups	:	**SU 22**	Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category	:	**ERC8b**	Wide dispersive indoor use of reactive substances in open systems
Process category	:	**PROC15**	Use as laboratory reagent
Product category	:	**PC21**	Laboratory chemicals

14.2. Conditions of use affecting exposure

14.2.1 Contributing scenario controlling environmental exposure for: ERC8b Wide dispersive indoor use of reactive substances in open systems

Amount

Local daily emission to waste water	:	0.022 g
Maximum daily local emission to air	:	0.0011 g
Local daily emission to soil	:	0 g
Daily amount for wide disperse uses	:	1.1 g

Environmental factors

Flow rate	:	18,000 m3/d

Conditions and measures related to sewage treatment plant

Type of Sewage Treatment Plant	:	Municipal STP
Flow rate of sewage treatment plant effluent	:	2,000 m3/d
Effectiveness (of a measure)	:	0.6 %

14.2.2 Contributing scenario controlling worker exposure for: PROC15 Use as laboratory reagent

Product characteristics

Concentration of the Substance in Mixture/Article		Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Dustiness: High

Frequency and duration of use

Exposure duration	:	< 4 h

Other operational conditions affecting workers exposure

Outdoor / Indoor	:	Indoor
Remarks	:	Covers use at ambient temperatures.

Technical conditions and measures

Provide a basic standard of general ventilation (1 to 3 air changes per hour) .
Local exhaust ventilation - efficiency of at least (Effectiveness (of a measure): 80 %)

Conditions and measures related to personal protection, hygiene and health evaluation

Use suitable eye protection., Wear suitable gloves tested to EN374.

14.3. Exposure estimation and reference to its source

Environment

Release factor	Value type	Compartment	Environmental exposure	RCR
ERC8b	Local PEC	Fresh water	0.004 mg/l	< 0.01
		Fresh water sediment	0.03 mg/kg (dw)	< 0.01
		STP	< 0.001 mg/l	< 0.01
		Agricultural soil	0.003 mg/kg (dw)	< 0.01
	Regional PEC	Fresh water	0.004 mg/l	< 0.01
		Fresh water sediment	0.029 mg/kg (dw)	< 0.01
		Marine water	< 0.0004 mg/l	
		Marine sediment	0.003 mg/kg (dw)	
		Air	< 0.0001 mg/m³	
		Agricultural soil	0.003 mg/kg (dw)	< 0.01

Human Health

Contributing Scenario	Specific conditions	Value type	Level of Exposure	RCR
PROC15		Inhalation - Long-term - systemic effects	0.6 mg/m³	0.194
		Inhalation - Acute - local effects	4 mg/m³	0.784

RCR = Risk characterisation ratio

ERC8b Exposure Assessment Method : Used EUSES model.
PROC15 Exposure Assessment Method : Used ECETOC TRA model.

14.4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

14.4.1 Environment
If a DU has OC/RMMs outside specifications in the ES, then the DU can evaluate whether he works inside the boundaries set by the ES through scaling in EUSES.
The main driving parameters are :
- local amount used (tonnage)
- release factor prior to on-site treatment
- on-site wastewater treatment presence and efficiency
- dilution factor,Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

14.4.2 Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented., Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.