

SAFETY DATA SHEET



n-Butyl acetate
10430

Version / Revision
Supersedes Version

5
4.00***

Revision Date
Issuing date

03-Sep-2019
03-Sep-2019

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

1.1. Product identifier

Identification of the
substance/preparation

n-Butyl acetate

CAS-No 123-86-4
EC No. 204-658-1
Registration number (REACH) 01-2119485493-29

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

Identified uses Formulation
Distribution of substance
coatings
cleaning agent
laboratory chemicals

Uses advised against None

1.3. Details of the supplier of the safety data sheet

Company/Undertaking
Identification **OXEA GmbH**
Rheinpromenade 4A
D-40789 Monheim
Germany

Product Information Product Stewardship
FAX: +49 (0)208 693 2053
email: psq@oxea-chemicals.com

1.4. Emergency telephone number

Emergency telephone number +44 (0) 1235 239 670 (UK)
available 24/7

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

This substance is classified based on Directive 1272/2008/EC and its amendments (CLP Regulation)

Flammable liquid Category 3, H226
Target Organ Systemic Toxicant - Single exposure Category 3, H336

Additional information

For full text of Hazard- and EU Hazard-statements see SECTION 16.

2.2. Label elements

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Labelling according to Regulation 1272/2008/EC and its amendments (CLP Regulation).

Hazard pictograms



Signal word

Warning

Hazard statements

H226: Flammable liquid and vapour.
H336: May cause drowsiness or dizziness.

Precautionary statements

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P261: Avoid breathing gas/mist/vapours.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P312: Call a POISON CENTRE/doctor if you feel unwell.
P403 + P235: Store in a well ventilated place. Keep cool.

Supplemental Hazard Information (EU)

EUH 066: Repeated exposure may cause skin dryness or cracking.

2.3. Other hazards

Vapours may form explosive mixture with air

Vapour is heavier than air and can travel considerable distance to a source of ignition and flashback

Components of the product may be absorbed into the body by inhalation

PBT and vPvB assessment

This substance is not considered to be persistent, bioaccumulating nor toxic (PBT), nor very persistent nor very bioaccumulating (vPvB)

SECTION 3: Composition / information on ingredients

3.1. Substances

Component	CAS-No	REACH-No	1272/2008/EC	Concentration (%)
n-Butyl acetate	123-86-4	01-2119485493-29	Flam. Liq. 3; H226 STOT SE 3; H336 EU H066	> 99,0

For full text of Hazard- and EU Hazard-statements see SECTION 16.

SECTION 4: First aid measures

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4.1. Description of first aid measures

Inhalation

Keep at rest. Aerate with fresh air. When symptoms persist or in all cases of doubt seek medical advice.

Skin

Wash off immediately with soap and plenty of water. When symptoms persist or in all cases of doubt seek medical advice.

Eyes

Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses. Immediate medical attention is required.

Ingestion

Call a physician immediately. Do not induce vomiting without medical advice.

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

Main symptoms

cough, nausea, vomiting, headache, unconsciousness, shortness of breath, dizziness, narcosis.

Special hazard

Lung oedema, central nervous system effects, Prolonged skin contact may defat the skin and produce dermatitis.

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

General advice

Remove contaminated, soaked clothing immediately and dispose of safely. First aider needs to protect himself.

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media

foam, dry chemical, carbon dioxide (CO₂), water spray

Unsuitable Extinguishing Media

Do not use a solid water stream as it may scatter and spread fire.

5.2. Special hazards arising from the substance or mixture

Under conditions giving incomplete combustion, hazardous gases produced may consist of:

carbon monoxide (CO)

carbon dioxide (CO₂)

Combustion gases of organic materials must in principle be graded as inhalation poisons

Vapour is heavier than air and can travel considerable distance to a source of ignition and flashback

Vapours may form explosive mixture with air

5.3. Advice for firefighters

Special protective equipment for firefighters

Fire fighter protection should include a self-contained breathing apparatus (NIOSH-approved or EN 133) and full fire-fighting turn out gear.

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Precautions for firefighting

Cool containers / tanks with water spray. Dike and collect water used to fight fire. Keep people away from and upwind of fire.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: For personal protective equipment see section 8. Avoid contact with skin and eyes. Avoid breathing vapors or mists. Keep people away from and upwind of spill/leak. Ensure adequate ventilation, especially in confined areas. Keep away from heat and sources of ignition.

For emergency responders: Personal protection see section 8.

6.2. Environmental precautions

Prevent further leakage or spillage. Do not discharge product into the aquatic environment without pretreatment (biological treatment plant).

6.3. Methods and material for containment and cleaning up

Methods for containment

Stop the flow of material, if possible without risk. Dike spilled material, where this is possible.

Methods for cleaning up

Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. If liquid has been spilt in large quantities clean up promptly by scoop or vacuum. Dispose of in accordance with local regulations. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours).

6.4. Reference to other sections

For personal protective equipment see section 8.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Further info may be available in the appropriate Exposure scenarios in the annex to this SDS.

Advice on safe handling

Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product. Provide sufficient air exchange and/or exhaust in work rooms.

Hygiene measures

When using, do not eat, drink or smoke. Take off all contaminated clothing immediately. Wash hands before breaks and immediately after handling the product.

Advice on the protection of the environment

See Section 8: Environmental exposure controls.

Incompatible products

strong acids and strong bases
strong oxidizing agents

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7.2. Conditions for safe storage, including any incompatibilities

Advice on protection against fire and explosion

Keep away from sources of ignition - No smoking. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours). In case of fire, emergency cooling with water spray should be available. Ground and bond containers when transferring material. Vapour is heavier than air and can travel considerable distance to a source of ignition and flashback. Vapours may form explosive mixture with air.

Technical measures/Storage conditions

Keep containers tightly closed in a cool, well-ventilated place. Handle and open container with care.

Suitable material

stainless steel, mild steel, aluminium

Unsuitable material

copper, Attacks some forms of plastic and rubber

Temperature class

T2

7.3. Specific end use(s)

Formulation

Distribution of substance

coatings

cleaning agent

laboratory chemicals

For specific end use information see the annex of this safety data sheet

SECTION 8: Exposure controls / personal protection

8.1. Control parameters

Exposure limits European Union

No exposure limits established.

Exposure limits UK

EH40 WELs

Component	TWA (mg/m ³)	TWA (ppm)	STEL (mg/m ³)	STEL (ppm)
n-Butyl acetate CAS: 123-86-4	724	150	966	200

Note

For details and further information please refer to the original regulation.

DNEL & PNEC

n-Butyl acetate, CAS: 123-86-4

Workers

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DN(M)EL - long-term exposure - systemic effects - Inhalation	300 mg/m ³
DN(M)EL - acute / short-term exposure - systemic effects - Inhalation	600 mg/m ³
DN(M)EL - long-term exposure - local effects - Inhalation	300 mg/m ³
DN(M)EL - acute / short-term exposure - local effects - Inhalation	600 mg/m ³
DN(M)EL - long-term exposure - systemic effects - Dermal	11 mg/kg bw/day
DN(M)EL - acute / short-term exposure - systemic effects - Dermal	11 mg/kg bw/day
DN(M)EL - long-term exposure - local effects - Dermal	No hazard identified
DN(M)EL - acute / short-term exposure - local effects - Dermal	No hazard identified
DN(M)EL - local effects - eyes	No hazard identified

General population

DN(M)EL - long-term exposure - systemic effects - Inhalation	35,7 mg/m ³
DN(M)EL - acute / short-term exposure - systemic effects - Inhalation	300 mg/m ³
DN(M)EL - long-term exposure - local effects - Inhalation	35,7 mg/m ³
DN(M)EL - acute / short-term exposure - local effects - Inhalation	300 mg/m ³
DN(M)EL - long-term exposure - systemic effects - Dermal	6 mg/kg bw/day
DN(M)EL - acute / short-term exposure - systemic effects - Dermal	6 mg/kg bw/day
DN(M)EL - long-term exposure - local effects - Dermal	No hazard identified
DN(M)EL - acute / short-term exposure - local effects - Dermal	No hazard identified
DN(M)EL - long-term exposure - systemic effects - Oral	2 mg/kg bw/day
DN(M)EL - acute / short-term exposure - systemic effects - Oral	2 mg/kg bw/day
DN(M)EL - local effects - eyes	No hazard identified

Environment

PNEC aqua - freshwater	0,18 mg/l
PNEC aqua - marine water	0,018 mg/l
PNEC aqua - intermittent releases	0,36 mg/l
PNEC STP	35,6 mg/l
PNEC sediment - freshwater	0,981 mg/kg
PNEC sediment - marine water	0,0981 mg/l
PNEC soil	0,0903 mg/kg
Secondary poisoning	No potential for bioaccumulation

8.2. Exposure controls

Special adaptations (REACH)

Not applicable.

Appropriate Engineering controls

General or dilution ventilation is frequently insufficient as the sole means of controlling employee exposure. Local ventilation is usually preferred. Explosion-proof equipment (for example fans, switches, and grounded ducts) should be used in mechanical ventilation systems.

Personal protective equipment

General industrial hygiene practice

Avoid contact with skin, eyes and clothing. Do not breathe vapours or spray mist. Ensure that eyewash stations and safety showers are close to the workstation location.

Hygiene measures

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When using, do not eat, drink or smoke. Take off all contaminated clothing immediately. Wash hands before breaks and immediately after handling the product.

Eye protection

Tightly fitting safety goggles. In addition to goggles, wear a face shield if there is a reasonable chance for splash to the face.

Equipment should conform to EN 166

Hand protection

Wear protective gloves. Recommendations are listed below. Other protective material may be used, depending on the situation, if adequate degradation and permeation data is available. If other chemicals are used in conjunction with this chemical, material selection should be based on protection for all chemicals present.

Suitable material	butyl-rubber
Evaluation	according to EN 374: level 3
Glove thickness	approx 0,3 mm
Break through time	approx 60 min

Suitable material	polyvinylchloride / nitrile rubber
Evaluation	according to EN 374: level 2
Glove thickness	approx 0,9 mm
Break through time	approx 30 min

Skin and body protection

Impervious clothing. Wear face-shield and protective suit for abnormal processing problems.

Respiratory protection

Respirator with A filter. Full mask with above mentioned filter according to producers using requirements or self-contained breathing apparatus. Equipment should conform to EN 136 or EN 140 and EN 143.

Environmental exposure controls

If possible use in closed systems. If leakage can not be prevented, the substance needs to be suck off at the emersion point, if possible without danger. Observe the exposure limits, clean exhaust air if needed. If recycling is not practicable, dispose of in compliance with local regulations. Inform the responsible authorities in case of leakage into the atmosphere, or of entry into waterways, soil or drains.

Additional advice

Further details on substance data can be found in the registration dossier under the following link:
<http://echa.europa.eu/information-on-chemicals/registered-substances>. For specific exposure controls see the annex to this safety data sheet.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	liquid
Colour	colourless
Odour	fruity
Odour threshold	7 - 20 ppm
pH	6,2 (5,3 g/l in water @ 20 °C (68 °F))
Melting point/range	< -90 °C (Pour point)
Method	DIN ISO 3016
Boiling point/range	126 °C @ 1013 hPa
Method	OECD 103
Flash point	27 °C @ 1013 hPa

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Method	EU A.9
Evaporation rate	1,0 (n-Butyl acetate = 1)
Flammability (solid, gas)	Does not apply, the substance is a liquid
Lower explosion limit	1,2 Vol %
Upper explosion limit	7,5 Vol %

Vapour pressure

Values [hPa]	Values [kPa]	Values [atm]	@ °C	@ °F	Method
11,2	1,12	0,0112	20	68	OECD 104
57,9	5,79	0,0579	50	122	OECD 104

Vapour density 4,0 (Air = 1) @ 20 °C (68 °F)

Relative density

Values	@ °C	@ °F	Method
0,881	20	68	DIN 51757

Solubility 5,3 g/l @ 20 °C, in water, OECD 105

log Pow 2,3 (measured), OECD 117

Autoignition temperature 415 °C @ 1013 hPa

Method DIN 51794

Decomposition temperature No data available

Viscosity 0,83 mPa*s @ 20 °C

Method OECD 114

Explosive properties Does not apply, substance is not explosive. There are no chemical groups associated with explosive properties

Oxidizing properties Does not apply, substance is not oxidising. There are no chemical groups associated with oxidizing properties

9.2. Other information

Molecular weight	116,16
Molecular formula	C6 H12 O2
Refractive index	1,393 @ 20 °C
Surface tension	61,3 mN/m (1 g/l @ 20°C (68°F)), OECD 115

SECTION 10: Stability and Reactivity

10.1. Reactivity

The reactivity of the product corresponds to the typical reactivity shown by the substance group as described in any text book on organic chemistry.

10.2. Chemical stability

Stable under recommended storage conditions.

10.3. Possibility of hazardous reactions

Vapours may form explosive mixture with air.

10.4. Conditions to avoid

Avoid contact with heat, sparks, open flame and static discharge. Avoid any source of ignition.

10.5. Incompatible materials

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strong acids and strong bases, strong oxidizing agents.

10.6. Hazardous decomposition products

No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Likely routes of exposure Ingestion, Inhalation, Eye contact, Skin contact

Acute toxicity				
n-Butyl acetate (123-86-4)				
Routes of Exposure	Endpoint	Values	Species	Method
Oral	LD50	10760 mg/kg	rat, male/female	OECD 423
Dermal	LD50	> 14112 mg/kg	rabbit	OECD 402
Inhalative	LC50	> 20 mg/l (4h)		

n-Butyl acetate, CAS: 123-86-4

Assessment

Based on available data, the classification criteria are not met for:

Acute oral toxicity

Acute dermal toxicity

Acute inhalation toxicity

Irritation and corrosion				
n-Butyl acetate (123-86-4)				
Target Organ Effects	Species	Result	Method	
Skin	rabbit	No skin irritation	OECD 404	
Eyes	rabbit	No eye irritation	OECD 405	
Respiratory tract	human	Low irritating potential		

n-Butyl acetate, CAS: 123-86-4

Assessment

Based on available data, the classification criteria are not met for:

skin irritation/corrosion

eye irritation/corrosion

respiratory irritation

Sensitization				
n-Butyl acetate (123-86-4)				
Target Organ Effects	Species	Evaluation	Method	
Skin	mouse	not sensitizing		

n-Butyl acetate, CAS: 123-86-4

Assessment

Based on available data, the classification criteria are not met for:

Skin sensitization

For respiratory sensitization, no data are available

Subacute, subchronic and prolonged toxicity

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n-Butyl acetate (123-86-4)					
Type	Dose	Species	Method		
90-day	NOAEC: 500 ppm	rat, male/female	EPA OTS 798.2450	Inhalation	
90-day	NOAEL: 125 mg/kg/d	rat, male/female		Oral read across	
90-day	LOAEL: 500 mg/kg/d	rat, male/female		Oral read across	

n-Butyl acetate, CAS: 123-86-4

Assessment

Based on available data, the classification criteria are not met for:
STOT RE

Carcinogenicity, Mutagenicity, Reproductive toxicity					
n-Butyl acetate (123-86-4)					
Type	Dose	Species	Evaluation	Method	
Mutagenicity		Salmonella typhimurium	negative	OECD 471 (Ames)	
Mutagenicity		CHL (Chinese hamster lung cells)	negative (without metabolic activation)	Chromosomal Aberration	In vitro study
Mutagenicity		V79 cells, Chinese hamster	negative	OECD 476 (Mammalian Gene Mutation) HPRT	In vitro study read across
Mutagenicity		mouse	negative	OECD 474	in vivo read across
Reproductive toxicity	NOEC 9640 mg/m ³	rat rabbit rat, male/female		OECD 416	
Developmental Toxicity	LOAEC: 7230 mg/m ³	rat rabbit		OECD 414, Inhalative	Maternal toxicity Developmental toxicity

n-Butyl acetate, CAS: 123-86-4

CMR Classification

The available data on CMR properties are summarized in the table above. They do not indicate a classification into categories 1A or 1B

Evaluation

In vitro tests did not show mutagenic effects
Did not show mutagenic effects in animal experiments
No developmental effects in the absence of maternal toxicity
No cancer study was conducted
In the absence of specific alerts no cancer testing is required

n-Butyl acetate, CAS: 123-86-4

Main symptoms

dizziness, narcosis, cough, nausea, vomiting, headache, unconsciousness, shortness of breath.

Target Organ Systemic Toxicant - Single exposure

The available data lead to the classification given in section 2

Target Organ Systemic Toxicant - Repeated exposure

Repeated exposure may cause skin dryness or cracking
Based on available data, the classification criteria are not met for:
STOT RE

Other adverse effects

Components of the product may be absorbed into the body by inhalation.

Note

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Handle in accordance with good industrial hygiene and safety practice. Further details on substance data can be found in the registration dossier under the following link:
<http://echa.europa.eu/information-on-chemicals/registered-substances>.

SECTION 12: Ecological information

12.1. Toxicity

Acute aquatic toxicity			
n-Butyl acetate (123-86-4)			
Species	Exposure time	Dose	Method
Pimephales promelas (fathead minnow)	96h	LC50: 18 mg/l	OECD 203
Selenastrum capricornutum (green algae)	72h	EC50: 397 mg/l	OECD 201 Growth rate
Tetrahymena pyriformis	40 h	IC50: 356 mg/l	
Daphnia magna (Water flea)	48h	EC50: 44 mg/l	OECD 202

Long term toxicity				
n-Butyl acetate (123-86-4)				
Type	Species	Dose	Method	
Aquatic toxicity	Selenastrum capricornutum (green algae)	NOEC: 196 mg/l	OECD 201 Growth rate	
Aquatic toxicity Reproductive toxicity	Daphnia magna (Water flea)	EC50: 34,2 mg/l/21d	OECD 211	read across
Aquatic toxicity Reproductive toxicity	Daphnia magna (Water flea)	NOAEC: 23,2 mg/l (21d)	OECD 211	read across

12.2. Persistence and degradability

n-Butyl acetate, CAS: 123-86-4

Biodegradation

83 % (28 d), aerobic, Readily biodegradable, OECD 301 D.

Abiotic Degradation		
n-Butyl acetate (123-86-4)		
Type	Result	Method
Hydrolysis	t _{1/2} (pH 7): 2,14 yr @ 25°C	
Photolysis	No data available	

12.3. Bioaccumulative potential

n-Butyl acetate (123-86-4)		
Type	Result	Method
BCF	15	calculated
log Pow	2,3	measured, OECD 117

12.4. Mobility in soil

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n-Butyl acetate (123-86-4)		
Type	Result	Method
Surface tension	61,3 mN/m (1 g/l @ 20°C (68°F))	OECD 115
Adsorption/Desorption	log Koc: 1,27 @ 25 °C	calculated
Distribution to environmental compartments	no data available	

12.5. Results of PBT and vPvB assessment

n-Butyl acetate, CAS: 123-86-4

PBT and vPvB assessment

This substance is not considered to be persistent, bioaccumulating nor toxic (PBT), nor very persistent nor very bioaccumulating (vPvB)

12.6. Other adverse effects

n-Butyl acetate, CAS: 123-86-4

No data available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product Information

Disposal required in compliance with all waste management related state and local regulations. The choice of the appropriate method of disposal depends on the product composition by the time of disposal as well as the local statutes and possibilities for disposal.

Hazardous waste according to European Waste Catalogue (EWC)

Uncleaned empty packaging

Contaminated packaging should be emptied as far as possible and after appropriate cleansing may be taken for reuse.

SECTION 14: Transport information

ADR/RID

14.1. UN number	UN 1123
14.2. UN proper shipping name	Butyl acetates
14.3. Transport hazard class(es)	3
14.4. Packing group	III
14.5. Environmental hazards	no
14.6. Special precautions for user	
ADR Tunnel restriction code	(D/E)
Classification Code	F1
Hazard Number	30

ADN

ADN Container

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14.1. UN number	UN 1123
14.2. UN proper shipping name	Butyl acetates
14.3. Transport hazard class(es)	3
14.4. Packing group	III
14.5. Environmental hazards	no
14.6. Special precautions for user	
Classification Code	F1
Hazard Number	30

ADN

ADN Tanker

14.1. UN number	UN 1123
14.2. UN proper shipping name	Butyl acetates
14.3. Transport hazard class(es)	3
Subsidiary Risk	N3
14.4. Packing group	III
14.5. Environmental hazards	no
14.6. Special precautions for user	
Classification Code	F1

ICAO-TI / IATA-DGR

14.1. UN number	UN 1123
14.2. UN proper shipping name	Butyl acetates
14.3. Transport hazard class(es)	3
14.4. Packing group	III
14.5. Environmental hazards	no
14.6. Special precautions for user	no data available

IMDG

14.1. UN number	UN 1123
14.2. UN proper shipping name	Butyl acetates
14.3. Transport hazard class(es)	3
14.4. Packing group	III
14.5. Environmental hazards	no
14.6. Special precautions for user	
EmS	F-E, S-D
14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code	
Product name	Butyl acetate
Ship type	3
Pollution category	Y

SECTION 15: Regulatory information

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

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Regulation 1272/2008, Annex VI

n-Butyl acetate, CAS: 123-86-4

Classification Flam. Liq. 3; H226
STOT SE 3; H336

Hazard pictograms GHS02 Flame
GHS07 Exclamation mark

Signal word Warning

Hazard statements H226, H336
EUH066

DI 2012/18/EU (Seveso III)

Category Annex I, part 1:
P5a - c; depending on conditions

DI 1999/13/EC (VOC Guideline)

Component	Status
n-Butyl acetate CAS: 123-86-4	regulated

International Inventories

n-Butyl acetate, CAS: 123-86-4

AICS (AU)
DSL (CA)
IECSC (CN)
EC-No. 2046581 (EU)
ENCS (2)-731 (JP)
ISHL (2)-731 (JP)
ISHL 2-(6)-226 (JP)
KECI KE-04179 (KR)
INSQ (MX)
PICCS (PH)
TSCA (US)
NZIoC (NZ)
TCSI (TW)

National regulatory information Great Britain

Releases to air (Pollution Inventory Substances)

not subject

Releases to water (Pollution Inventory Substances)

not subject

Releases to sewer (Pollution Inventory Substances)

not subject

For details and further information please refer to the original regulation

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15.2. Chemical safety assessment

The Chemical Safety Report (CSR) has been generated. For Exposure Scenarios see the annex.

SECTION 16: Other information

Full text of H-Statements referred to under sections 2 and 3

H226: Flammable liquid and vapour.

H336: May cause drowsiness or dizziness.

EUH 066: Repeated exposure may cause skin dryness or cracking.

Abbreviations

A table of terms and abbreviations can be found under the following link:

http://echa.europa.eu/documents/10162/13632/information_requirements_r20_en.pdf

Training advice

For effective first-aid, special training / education is needed.

Sources of key data used to compile the datasheet

Information contained in this safety data sheet is based on Oxea owned data and public sources deemed valid or acceptable. The absence of data elements required by OSHA, ANSI or Annex II, Regulation 1907/2006/EC indicates, that no data meeting these requirements is available.

Further information for the safety data sheet

Changes against the previous version are marked by ***. Observe national and local legal requirements. For more information, other material safety data sheets or technical data sheets please consult the Oxea homepage (www.oxea-chemicals.com).

Disclaimer

For industrial use only. The information contained herein is accurate to the best of our knowledge. We do not suggest or guarantee that any hazards listed herein are the only ones which exist. Oxea makes no warranty of any kind, express or implied, concerning the safe use of this material in your process or in combination with other substances. User has the sole responsibility to determine the suitability of the materials for any use and the manner of use contemplated. User must meet all applicable safety and health standards.

End of Safety Data Sheet

Annex to the extended Safety Data Sheet (eSDS)

General information

Acute Health Hazard:

Risks resulting from short-term exposure are covered by the long-term exposure assessment

For consumer applications in the following usage areas please contact Oxea (psq@oxea-chemicals.com):

Uses in coatings

Use in Cleaning Agents

Consumer uses e.g. as a carrier in cosmetics/personal care products, perfumes and fragrances (PC39, SU21).

Note: For cosmetic and personal care products, risk assessment only required for the environment under REACH as human health is covered by alternative legislation

Other combinations of operational conditions may also be safe. Please contact Oxea in case your local

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operational conditions differ from the ones described below and you are unsure if they are also safe

For specific information regarding the SPERC used please refer to the ESIG webpage
www.esig.org/en/regulatory-information/reach/ges-library***

Exposure scenario identification

- 1 **Formulation & (re)packing of substances and mixtures**
- 2 **Distribution of substance**
- 3 **Uses in coatings**
- 4 **Uses in coatings**
- 5 **Use in Cleaning Products**
- 6 **Use in Cleaning Products**
- 7 **Use in laboratories**
- 8 **Use in laboratories**

Number of the ES 1

Short title of the exposure scenario

Formulation & (re)packing of substances and mixtures

List of use descriptors

Sector of uses [SU]

SU3: Industrial uses: Uses of substances as such or in preparations at industrial sites

SU10: Formulation [mixing] of preparations and/or re-packaging (excluding alloys)

Process categories [PROC]

PROC1: Use in closed process, no likelihood of exposure

PROC2: Use in closed, continuous process with occasional controlled exposure

PROC3: Use in closed batch process (synthesis or formulation)

PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises

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)

PROC14: production of preparations or articles by tableting, compression, extrusion, pelettisation

PROC15: Use as laboratory reagent

Environmental release categories [ERC]

ERC2: Formulation of preparations (mixtures)

Product characteristics

Refer to attached safety data sheets

Processes and activities covered by the exposure scenario

Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tableting, compression, pelletisation, extrusion, large and small scale packing, sampling,

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maintenance and associated laboratory activities.

Further explanations

Industrial use

Assumes use at not more than 20°C above ambient temperature (unless stated differently)

Assumes an advanced standard of occupational Health and Safety Management System

Contributing Scenarios

Number of the contributing scenario	1
Contributing exposure scenario controlling environmental exposure for ERC 2	

Further specification

SpERC ESVOC 2.2.v1 (ESVOC 4), release factors for (Sp)ERC were modified, assessment tool used: Chesar 2.3.

Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP.

Amounts used

Daily amount per site: 13.33 to

Annual amount per site: 4000 to

Fraction of Regional tonnage used locally: 1

Frequency and duration of use

Covers use up to: 300 days

Environment factors not influenced by risk management

River flow rate: 18000 m³/d Local freshwater dilution factor: 10 Local marine water dilution factor: 100

Technical conditions and measures at process level (source) to prevent release

Release fraction to air from process: 2.5 %

Release fraction to wastewater from process: 0.05 %

Release fraction to soil from process: 0.01%

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Onsite treatment wastewater. Apply acclimated biological treatment. Assumed Efficiency: 90 %

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/ treatment plant (m³/d): 2000

Estimated substance removal from wastewater via domestic sewage treatment (%): 88.9

Do not apply industrial sludge to natural soils

Number of the contributing scenario	2
Contributing exposure scenario controlling worker exposure for PROC 1	

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Covers percentage substance in the product up to 100 % (unless stated differently)

Liquid, vapour pressure 0,5 - 10 kPa at STP

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 1 hand (240 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

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

Number of the contributing scenario	3
Contributing exposure scenario controlling worker exposure for PROC 2	

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Further specification

assessment tool used: Chesar 2.3

Product characteristics

Covers percentage substance in the product up to 100 % (unless stated differently)

Liquid, vapour pressure 0,5 - 10 kPa at STP

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 2 hands (480 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

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

Number of the contributing scenario 4
Contributing exposure scenario controlling worker exposure for PROC 3

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Covers percentage substance in the product up to 100 % (unless stated differently)

Liquid, vapour pressure 0,5 - 10 kPa at STP

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 1 hand (240 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

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

Number of the contributing scenario 5
Contributing exposure scenario controlling worker exposure for PROC 4

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Covers percentage substance in the product up to 100 % (unless stated differently)

Liquid, vapour pressure 0,5 - 10 kPa at STP

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 2 hands (480 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

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.

Number of the contributing scenario 6
Contributing exposure scenario controlling worker exposure for PROC 5

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Covers percentage substance in the product up to 100 % (unless stated differently)

Liquid, vapour pressure 0,5 - 10 kPa at STP

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Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 2 hands (480 cm²)

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative). If no adequate ventilation is available, respiratory protection (efficiency 90 %) must be used.

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

Wear suitable gloves tested to EN374.

Number of the contributing scenario

7

Contributing exposure scenario controlling worker exposure for PROC 8a

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Covers percentage substance in the product up to 100 % (unless stated differently)

Liquid, vapour pressure 0,5 - 10 kPa at STP

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to 2 hands (960 cm²)

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative). If no adequate ventilation is available, respiratory protection (efficiency 90 %) must be used.

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

Wear suitable gloves tested to EN374.

Number of the contributing scenario

8

Contributing exposure scenario controlling worker exposure for PROC 8b

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Covers percentage substance in the product up to 100 % (unless stated differently)

Liquid, vapour pressure 0,5 - 10 kPa at STP

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to 2 hands (960 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

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 chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

Number of the contributing scenario

9

Contributing exposure scenario controlling worker exposure for PROC 9

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Covers percentage substance in the product up to 100 % (unless stated differently)

Liquid, vapour pressure 0,5 - 10 kPa at STP

Frequency and duration of use

8 h (full shift)

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Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 2 hands (480 cm²)

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative). If no adequate ventilation is available, respiratory protection (efficiency 90 %) must be used.

Number of the contributing scenario

10

Contributing exposure scenario controlling worker exposure for PROC 14

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Covers percentage substance in the product up to 100 % (unless stated differently)

Liquid, vapour pressure 0,5 - 10 kPa at STP

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 2 hands (480 cm²)

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative). If no adequate ventilation is available, respiratory protection (efficiency 90 %) must be used.

Number of the contributing scenario

11

Contributing exposure scenario controlling worker exposure for PROC 15

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Covers percentage substance in the product up to 100 % (unless stated differently)

Liquid, vapour pressure 0,5 - 10 kPa at STP

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 1 hand (240 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

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

Exposure estimation and reference to its source

Environment

PEC = predicted environmental concentration (local); RCR = risk characterisation ratio

Fresh Water (Pelagic)	PEC: 0.037 mg/l; RCR: 0.208
Fresh Water (Sediment)	PEC: 0.75 mg/kg dw; RCR: 0.765
Marine Water (Pelagic)	PEC: 0.004 mg/l; RCR: 0.208
Marine Water (Sediment)	PEC: 0.075 mg/kg dw; RCR: 0.764
Agricultural Soil	PEC: 0.012 mg/kg dw; RCR: 0.129
Sewage Treatment Plant (Effluent)	PEC: 0.372 mg/l; RCR: 0.01

Human exposure prediction (oral, dermal, inhalative)

Oral exposure is not expected to occur. Exposure estimates are given for either short-term or long-term exposure depending on which lead to more conservative risk characterisation ratios. The RMMs described above suffice to control risks for both local and systemic effects. EE(inhal): Estimated inhalative long-term exposure [mg/m³]; EE(derm): Estimated dermal long-term exposure [mg/kg b.w./d].

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Proc 1	EE(inhal): 0.194 ; EE(derm): 0.034
Proc 2	EE(inhal): 96.8 ; EE(derm): 1.37
Proc 3	EE(inhal): 193.6 ; EE(derm): 0.69
Proc 4	EE(inhal): 387.2; EE(derm): 1.372
Proc 5	EE(inhal): 96.8 ; EE(derm): 2.742
Proc 8a	EE(inhal): 96.8; EE(derm): 2.742
Proc 8b	EE(inhal): 484 ; EE(derm): 1.371
Proc 9	EE(inhal): 96.8 ; EE(derm): 6.86
Proc 14	EE(inhal): 96.8 ; EE(derm): 3.43
Proc 15	EE(inhal): 193.6 ; EE(derm): 0.34

Risk characterisation

RCR(inhal): inhalative risk characterisation ratio; RCR(derm): dermal risk characterisation ratio; total RCR= RCR(inhal) +RCR(derm). Where required local and systemic effects were evaluated both for short-term and long-term exposure. The RCR's given correspond in each case to the most conservative calculated values.

Proc 1	RCR(inhal): 0.0003 ; RCR(derm): 0.003
Proc 2	RCR(inhal): 0.161 ; RCR(derm): 0.124
Proc 3	RCR(inhal): 0.323 ; RCR(derm): 0.063
Proc 4	RCR(inhal): 0.645 ; RCR(derm): 0.125
Proc 5	RCR(inhal): 0.161 ; RCR(derm): 0.249
Proc 8a	RCR(inhal): 0.161 ; RCR(derm): 0.249
Proc 8b	RCR(inhal): 0.807 ; RCR(derm): 0.125
Proc 9	RCR(inhal): 0.161 ; RCR(derm): 0.624
Proc 14	RCR(inhal): 0.161 ; RCR(derm): 0.312
Proc 15	RCR(inhal): 0.323 ; RCR(derm): 0.031

Number of the ES 2

Short title of the exposure scenario

Distribution of substance

List of use descriptors

Sector of uses [SU]

SU3: Industrial uses: Uses of substances as such or in preparations at industrial sites

Process categories [PROC]

PROC1: Use in closed process, no likelihood of exposure

PROC2: Use in closed, continuous process with occasional controlled exposure

PROC3: Use in closed batch process (synthesis or formulation)

PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises

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)

PROC15: Use as laboratory reagent

Environmental release categories [ERC]

ERC2: Formulation of preparations (mixtures)

Product characteristics

Refer to attached safety data sheets

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Processes and activities covered by the exposure scenario

Loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading, distribution and associated laboratory activities.

Further explanations

Industrial use

Assumes use at not more than 20°C above ambient temperature (unless stated differently)

Assumes an advanced standard of occupational Health and Safety Management System

Contributing Scenarios

Number of the contributing scenario 1
Contributing exposure scenario controlling environmental exposure for ERC 2

Further specification

SpERC ESVOC 1.1b.v1 (ESVOC 3), release factors for (Sp)ERC were modified, assessment tool used: Chesar 2.3.

Amounts used

Annual amount per site: 120000 to

Daily amount per site: 0.08 to

Fraction of Regional tonnage used locally: 0.002

Frequency and duration of use

Covers use up to: 300 days

Environment factors not influenced by risk management

River flow rate: 18000 m³/d Local freshwater dilution factor: 10 Local marine water dilution factor: 100

Other given operational conditions affecting environmental exposure

Indoor/Outdoor use

Technical conditions and measures at process level (source) to prevent release

Release fraction to air from process: 0.01 %

Release fraction to wastewater from process: 0.001 %

Release fraction to soil from process: 0.001%

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Onsite treatment off-air. Apply vapour recovery (Adsorption, ...). Assumed Efficiency: 90 %

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/ treatment plant (m³/d): 2000

The minimum grade of elimination in the sewage plant is (%): 88.9

Number of the contributing scenario 2
Contributing exposure scenario controlling worker exposure for PROC 1

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP

Covers percentage substance in the product up to 100 % (unless stated differently)

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 1 hand (240 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

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

Number of the contributing scenario 3
Contributing exposure scenario controlling worker exposure for PROC 2

Further specification

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assessment tool used: Chesar 2.3

Product characteristics

Covers percentage substance in the product up to 100 % (unless stated differently)

Liquid, vapour pressure 0,5 - 10 kPa at STP

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 2 hands (480 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

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

Number of the contributing scenario

4

Contributing exposure scenario controlling worker exposure for PROC 3

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Covers percentage substance in the product up to 100 % (unless stated differently)

Liquid, vapour pressure 0,5 - 10 kPa at STP

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 1 hand (240 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

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

Number of the contributing scenario

5

Contributing exposure scenario controlling worker exposure for PROC 4

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Covers percentage substance in the product up to 100 % (unless stated differently)

Liquid, vapour pressure 0,5 - 10 kPa at STP

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 2 hands (480 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

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.

Number of the contributing scenario

6

Contributing exposure scenario controlling worker exposure for PROC 8a

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Covers percentage substance in the product up to 100 % (unless stated differently)

Liquid, vapour pressure 0,5 - 10 kPa at STP

Frequency and duration of use

8 h (full shift)

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Human factors not influenced by risk management

Area potentially exposed: corresponds to 2 hands (960 cm²)

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative). If no adequate ventilation is available, respiratory protection (efficiency 90 %) must be used.

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

Wear suitable gloves tested to EN374.

Number of the contributing scenario

7

Contributing exposure scenario controlling worker exposure for PROC 8b

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Covers percentage substance in the product up to 100 % (unless stated differently)

Liquid, vapour pressure 0,5 - 10 kPa at STP

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to 2 hands (960 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

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 chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

Number of the contributing scenario

8

Contributing exposure scenario controlling worker exposure for PROC 9

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Covers percentage substance in the product up to 100 % (unless stated differently)

Liquid, vapour pressure 0,5 - 10 kPa at STP

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 2 hands (480 cm²)

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative). If no adequate ventilation is available, respiratory protection (efficiency 90 %) must be used.

Number of the contributing scenario

9

Contributing exposure scenario controlling worker exposure for PROC 15

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Covers percentage substance in the product up to 100 % (unless stated differently)

Liquid, vapour pressure 0,5 - 10 kPa at STP

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 1 hand (240 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

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Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour).

Exposure estimation and reference to its source

Environment

PEC = predicted environmental concentration (local); RCR = risk characterisation ratio

Fresh Water (Pelagic)	PEC: 0.0003 mg/l; RCR: 0.002
Fresh Water (Sediment)	PEC: 0.006 mg/kg dw; RCR: 0.006
Marine Water (Pelagic)	PEC: 0.0000 mg/l; RCR: 0.001
Marine Water (Sediment)	PEC: 0.0005 mg/kg dw; RCR: 0.005
Agricultural Soil	PEC: 0.001 mg/kg dw; RCR: 0.016
Sewage Treatment Plant (Effluent)	PEC: 0.0000 mg/l; RCR: 0.0000

Human exposure prediction (oral, dermal, inhalative)

Oral exposure is not expected to occur. Exposure estimates are given for either short-term or long-term exposure depending on which lead to more conservative risk characterisation ratios. EE(inhal): Estimated inhalative long-term exposure [mg/m³]; EE(derm): Estimated dermal long-term exposure [mg/kg b.w./d]. The RMMs described above suffice to control risks for both local and systemic effects.

Proc 1	EE(inhal): 0.194; EE(derm): 0.034
Proc 2	EE(inhal): 96.8; EE(derm): 1.37
Proc 3	EE(inhal): 193.6; EE(derm): 0.69
Proc 4	EE(inhal): 387.2; EE(derm): 1.372
Proc 8a	EE(inhal): 96.8; EE(derm): 2.742
Proc 8b	EE(inhal): 484; EE(derm): 1.371
Proc 9	EE(inhal): 96.8; EE(derm): 6.86
Proc 15	EE(inhal): 193.6; EE(derm): 0.34

Risk characterisation

Where required local and systemic effects were evaluated both for short-term and long-term exposure. The RCR's given correspond in each case to the most conservative calculated values. RCR(inhal): inhalative risk characterisation ratio; RCR(derm): dermal risk characterisation ratio; total RCR= RCR(inhal) +RCR(derm).

Proc 1	RCR(inhal): 0.0003; RCR(derm): 0.003
Proc 2	RCR(inhal): 0.161; RCR(derm): 0.124
Proc 3	RCR(inhal): 0.323; RCR(derm): 0.063
Proc 4	RCR(inhal): 0.645; RCR(derm): 0.125
Proc 8a	RCR(inhal): 0.161; RCR(derm): 0.249
Proc 8b	RCR(inhal): 0.807; RCR(derm): 0.125
Proc 9	RCR(inhal): 0.161; RCR(derm): 0.624
Proc 15	RCR(inhal): 0.323; RCR(derm): 0.031

Number of the ES 3

Short title of the exposure scenario

Uses in coatings

List of use descriptors

Sector of uses [SU]

SU5: Manufacture of textiles, leather, fur
SU7: Printing and reproduction of recorded media

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Process categories [PROC]

PROC1: Use in closed process, no likelihood of exposure
PROC2: Use in closed, continuous process with occasional controlled exposure
PROC3: Use in closed batch process (synthesis or formulation)
PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises
PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)
PROC7: Industrial spraying
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
PROC10: Roller application or brushing
PROC13: Treatment of articles by dipping and pouring
PROC15: Use as laboratory reagent

Environmental release categories [ERC]

ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

Product characteristics

Refer to attached safety data sheets

Processes and activities covered by the exposure scenario

Covers the use in coatings (paints, inks, adhesives, etc) within closed or contained systems including incidental exposures during use (including materials receipt, storage, preparation and transfer from bulk and semi-bulk, application activities and film formation) and equipment cleaning, maintenance and associated laboratory activities.

Further explanations

Industrial use

Assumes use at not more than 20°C above ambient temperature (unless stated differently)

Contributing Scenarios

Number of the contributing scenario	1
Contributing exposure scenario controlling environmental exposure for ERC 4	

Further specification

SpERC ESVOC 4.3a.v1 (ESVOC 5), release factors for (Sp)ERC were modified, assessment tool used: Chesar 2.3.

Amounts used

Daily amount per site: 16.66 to
Annual amount per site: 5000 to
Fraction of Regional tonnage used locally: 1

Frequency and duration of use

Covers use up to: 300 days

Environment factors not influenced by risk management

River flow rate: 18000 m³/d Local freshwater dilution factor: 10 Local marine water dilution factor: 100

Technical conditions and measures at process level (source) to prevent release

Release fraction to air from process: 9.8 %
Release fraction to wastewater from process: 0.02 %
Release fraction to soil from process: 0%

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Onsite treatment off-air. Upgrade Systems in place or implement additional treatment. Assumed Efficiency: 90 % Onsite treatment wastewater. Apply acclimated biological treatment. Assumed Efficiency: 99 %

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/ treatment plant (m³/d): 2000
The minimum grade of elimination in the sewage plant is (%): 88.9
Do not apply industrial sludge to natural soils

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Number of the contributing scenario 2
Contributing exposure scenario controlling worker exposure for PROC 1

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP

Covers percentage substance in the product up to 100 % (unless stated differently)

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 1 hand (240 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

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

Number of the contributing scenario 3
Contributing exposure scenario controlling worker exposure for PROC 2

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP

Covers percentage substance in the product up to 100 % (unless stated differently)

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 2 hands (480 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

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

Number of the contributing scenario 4
Contributing exposure scenario controlling worker exposure for PROC 3

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP

Covers percentage substance in the product up to 100 % (unless stated differently)

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 1 hand (240 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

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

Number of the contributing scenario 5
Contributing exposure scenario controlling worker exposure for PROC 4

Further specification

assessment tool used: Chesar 2.3

Product characteristics

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Liquid, vapour pressure 0,5 - 10 kPa at STP
Covers percentage substance in the product up to 100 % (unless stated differently)

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 2 hands (480 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

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.

Number of the contributing scenario

6

Contributing exposure scenario controlling worker exposure for PROC 5

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP

Covers percentage substance in the product up to 100 % (unless stated differently)

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 2 hands (480 cm²)

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative). If no adequate ventilation is available, respiratory protection (efficiency 90 %) must be used.

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

Wear suitable gloves tested to EN374.

Number of the contributing scenario

7

Contributing exposure scenario controlling worker exposure for PROC 7

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP

Covers percentage substance in the product up to 100 % (unless stated differently)

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to hands and lower arms (1500 cm²)

Other given operational conditions affecting workers exposure

Indoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 95 % (inhalative).

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

Number of the contributing scenario

8

Contributing exposure scenario controlling worker exposure for PROC 8a

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP

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Covers percentage substance in the product up to 100 % (unless stated differently)

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to 2 hands (960 cm²)

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative). If no adequate ventilation is available, respiratory protection (efficiency 90 %) must be used.

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

Wear suitable gloves tested to EN374.

Number of the contributing scenario 9

Contributing exposure scenario controlling worker exposure for PROC 8b

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP

Covers percentage substance in the product up to 100 % (unless stated differently)

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to 2 hands (960 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

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 chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

Number of the contributing scenario 10

Contributing exposure scenario controlling worker exposure for PROC 10

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP

Covers percentage substance in the product up to 100 % (unless stated differently)

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to 2 hands (960 cm²)

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative). If no adequate ventilation is available, respiratory protection (efficiency 90 %) must be used.

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

Wear suitable gloves tested to EN374.

Number of the contributing scenario 11

Contributing exposure scenario controlling worker exposure for PROC 13

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP

Covers percentage substance in the product up to 100 % (unless stated differently)

Frequency and duration of use

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8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 2 hands (480 cm²)

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative). If no adequate ventilation is available, respiratory protection (efficiency 90 %) must be used.

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

Wear suitable gloves tested to EN374.

Number of the contributing scenario

12

Contributing exposure scenario controlling worker exposure for PROC 15

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP

Covers percentage substance in the product up to 100 % (unless stated differently)

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 1 hand (240 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

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

Exposure estimation and reference to its source

Environment

PEC = predicted environmental concentration (local); RCR = risk characterisation ratio

Fresh Water (Pelagic)	PEC: 0.019 mg/l; RCR: 0.105
Fresh Water (Sediment)	PEC: 0.378 mg/kg dw; RCR: 0.385
Marine Water (Pelagic)	PEC: 0.002 mg/l; RCR: 0.105
Marine Water (Sediment)	PEC: 0.038 mg/kg dw; RCR: 0.385
Agricultural Soil	PEC: 0.057 mg/kg dw; RCR: 0.632
Sewage Treatment Plant (Effluent)	PEC: 0.186 mg/l; RCR: 0.005

Human exposure prediction (oral, dermal, inhalative)

Oral exposure is not expected to occur. EE(inhal): Estimated inhalative long-term exposure [mg/m³]; EE(derm): Estimated dermal long-term exposure [mg/kg b.w./d]. Exposure estimates are given for either short-term or long-term exposure depending on which lead to more conservative risk characterisation ratios. The RMMs described above suffice to control risks for both local and systemic effects.

Proc 1	EE(inhal): 0.194; EE(derm): 0.034
Proc 2	EE(inhal): 96.8; EE(derm): 1.37
Proc 3	EE(inhal): 193.6; EE(derm): 0.69
Proc 4	EE(inhal): 387.2; EE(derm): 1.372
Proc 5	EE(inhal): 96.8; EE(derm): 2.742
Proc 7	EE(inhal): 242; EE(derm): 4.286
Proc 8a	EE(inhal): 96.8; EE(derm): 2.742
Proc 8b	EE(inhal): 484; EE(derm): 1.372
Proc 10	EE(inhal): 96.8; EE(derm): 5.486
Proc 13	EE(inhal): 96.8; EE(derm): 2.742
Proc 15	EE(inhal): 193.6; EE(derm): 0.34

Risk characterisation

Where required local and systemic effects were evaluated both for short-term and long-term exposure. The RCR's

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given correspond in each case to the most conservative calculated values. RCR(inhal): inhalative risk characterisation ratio; RCR(derm): dermal risk characterisation ratio;
total RCR= RCR(inhal) +RCR(derm).

Proc 1	RCR(inhal): 0.0003; RCR(derm): 0.003
Proc 2	RCR(inhal): 0.161; RCR(derm): 0.124
Proc 3	RCR(inhal): 0.323; RCR(derm): 0.063
Proc 4	RCR(inhal): 0.645; RCR(derm): 0.125
Proc 5	RCR(inhal): 0.161; RCR(derm): 0.249
Proc 7	RCR(inhal): 0.403; RCR(derm): 0.390
Proc 8a	RCR(inhal): 0.161; RCR(derm): 0.249
Proc 8b	RCR(inhal): 0.807; RCR(derm): 0.125
Proc 10	RCR(inhal): 0.161; RCR(derm): 0.499
Proc 13	RCR(inhal): 0.161; RCR(derm): 0.249
Proc 15	RCR(inhal): 0.323; RCR(derm): 0.031

Number of the ES 4

Short title of the exposure scenario

Uses in coatings

List of use descriptors

Sector of uses [SU]

SU22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)

Process categories [PROC]

PROC1: Use in closed process, no likelihood of exposure

PROC2: Use in closed, continuous process with occasional controlled exposure

PROC3: Use in closed batch process (synthesis or formulation)

PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises

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

PROC10: Roller application or brushing

PROC11: Non industrial spraying

PROC13: Treatment of articles by dipping and pouring

PROC15: Use as laboratory reagent

PROC19: Hand-mixing with intimate contact and only PPE available

Environmental release categories [ERC]

ERC8a: Wide dispersive indoor use of processing aids in open systems

Product characteristics

Refer to attached safety data sheets

Processes and activities covered by the exposure scenario

Covers the use in coatings (paints, inks, adhesives, etc) within closed or contained systems including incidental exposures during use (including materials receipt, storage, preparation and transfer from bulk and semi-bulk, application activities and film formation) and equipment cleaning, maintenance and associated laboratory activities.

Further explanations

Professional use

Assumes use at not more than 20°C above ambient temperature (unless stated differently)

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Assumes a basic standard of occupational Health and Safety Management System

Contributing Scenarios

Number of the contributing scenario 1
Contributing exposure scenario controlling environmental exposure for ERC 8a

Further specification

SpERC ESVOG 8.3b.v1,
assessment tool used: Chesar 2.3.

Amounts used

daily wide dispersive use: 0.00055 to/d
Fraction of EU tonnage used in region: 0.1
Fraction of Regional tonnage used locally: 0.0005
Amounts used (EU): 4000 to/a

Environment factors not influenced by risk management

River flow rate: 18000 m³/d Local freshwater dilution factor: 10 Local marine water dilution factor: 100

Other given operational conditions affecting environmental exposure

Indoor/Outdoor use

Technical conditions and measures at process level (source) to prevent release

Release fraction to air from wide dispersive use (regional only): 98 %
Release fraction to wastewater from wide dispersive use: 1 %
Release fraction to soil from wide dispersive use (regional only): 1%

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/ treatment plant (m³/d): 2000
The minimum grade of elimination in the sewage plant is (%): 88.9

Conditions and measures related to external treatment of waste for disposal

Dispose of waste product or used containers according to local regulations

Number of the contributing scenario 2
Contributing exposure scenario controlling worker exposure for PROC 1

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP
Covers percentage substance in the product up to 100 % (unless stated differently)

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 1 hand (240 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

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

Number of the contributing scenario 3
Contributing exposure scenario controlling worker exposure for PROC 2

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP
Covers percentage substance in the product up to 100 % (unless stated differently)

Frequency and duration of use

8 h (full shift)

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Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 2 hands (480 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

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

Number of the contributing scenario 4

Contributing exposure scenario controlling worker exposure for PROC 3

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP

Covers percentage substance in the product up to 100 % (unless stated differently)

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 1 hand (240 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

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

Number of the contributing scenario 5

Contributing exposure scenario controlling worker exposure for PROC 4

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP

Covers percentage substance in the product up to 100 % (unless stated differently)

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 2 hands (480 cm²)

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative). If no adequate ventilation is available, respiratory protection (efficiency 90 %) must be used.

Number of the contributing scenario 6

Contributing exposure scenario controlling worker exposure for PROC 5

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP

Covers percentage substance in the product up to 100 % (unless stated differently)

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 2 hands (480 cm²)

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative). If no adequate ventilation is available, respiratory protection (efficiency 90 %) must be used.

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

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Wear suitable gloves tested to EN374.

Number of the contributing scenario 7
Contributing exposure scenario controlling worker exposure for PROC 8a

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP

Covers percentage substance in the product up to 100 % (unless stated differently)

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to 2 hands (960 cm²)

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative). If no adequate ventilation is available, respiratory protection (efficiency 90 %) must be used.

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

Wear suitable gloves tested to EN374.

Number of the contributing scenario 8
Contributing exposure scenario controlling worker exposure for PROC 8b

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP

Covers percentage substance in the product up to 100 % (unless stated differently)

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to 2 hands (960 cm²)

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative). If no adequate ventilation is available, respiratory protection (efficiency 90 %) must be used.

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

Wear suitable gloves tested to EN374.

Number of the contributing scenario 9
Contributing exposure scenario controlling worker exposure for PROC 10

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP

Covers percentage substance in the product up to 100 % (unless stated differently)

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to 2 hands (960 cm²)

Technical conditions and measures to control dispersion from source towards the worker

Provide extract ventilation to points where emissions occur. provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative). If no adequate ventilation is available, respiratory protection (efficiency 90 %) must be used.

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

Number of the contributing scenario 10

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Contributing exposure scenario controlling worker exposure for PROC 11

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP

Covers percentage substance in the product up to 25 %

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to hands and lower arms (1500 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear respiratory protection (Efficiency: 95 %).

Number of the contributing scenario

11

Contributing exposure scenario controlling worker exposure for PROC 11

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Covers percentage substance in the product up to 100 % (unless stated differently)

Liquid, vapour pressure 0,5 - 10 kPa at STP

Frequency and duration of use

Avoid carrying out activities involving exposure for more than 4 hours

Human factors not influenced by risk management

Area potentially exposed: corresponds to hands and lower arms (1500 cm²)

Other given operational conditions affecting workers exposure

Indoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative).

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear respiratory protection (Efficiency: 90 %).

Number of the contributing scenario

12

Contributing exposure scenario controlling worker exposure for PROC 11

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP

Covers percentage substance in the product up to 25 %

Frequency and duration of use

Avoid carrying out activities involving exposure for more than 4 hours

Human factors not influenced by risk management

Area potentially exposed: corresponds to hands and lower arms (1500 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear respiratory protection (Efficiency: 95 %).

Number of the contributing scenario

13

Contributing exposure scenario controlling worker exposure for PROC 13

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Further specification

assessment tool used: Chesar 2.3

Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP

Covers percentage substance in the product up to 25 %

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 2 hands (480 cm²)

Other given operational conditions affecting workers exposure

Indoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative).

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

Wear suitable gloves tested to EN374.

Number of the contributing scenario

14

Contributing exposure scenario controlling worker exposure for PROC 15

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP

Covers percentage substance in the product up to 100 % (unless stated differently)

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 1 hand (240 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

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

Number of the contributing scenario

15

Contributing exposure scenario controlling worker exposure for PROC 19

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP

Covers percentage substance in the product up to 100 % (unless stated differently)

Frequency and duration of use

Avoid carrying out activities involving exposure for more than 4 hours

Human factors not influenced by risk management

Area potentially exposed: corresponds to 1980 cm²

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

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 chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear respiratory protection (Efficiency: 95 %).

Exposure estimation and reference to its source

Environment

PEC = predicted environmental concentration (local); RCR = risk characterisation ratio

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Fresh Water (Pelagic)	PEC: 0.0003 mg/l; RCR: 0.002
Fresh Water (Sediment)	PEC: 0.006 mg/kg dw; RCR: 0.006
Marine Water (Pelagic)	PEC: 0.0000 mg/l; RCR: 0.0002
Marine Water (Sediment)	PEC: 0.0006 mg/kg dw; RCR: 0.006
Agricultural Soil	PEC: 0.0001 mg/kg dw; RCR: 0.002
Sewage Treatment Plant (Effluent)	PEC: 0.0003 mg/l; RCR: 0.0000

Human exposure prediction (oral, dermal, inhalative)

Oral exposure is not expected to occur. EE(inhal): Estimated inhalative long-term exposure [mg/m³]; EE(derm): Estimated dermal long-term exposure [mg/kg b.w./d]. Exposure estimates are given for either short-term or long-term exposure depending on which lead to more conservative risk characterisation ratios. The RMMs described above suffice to control risks for both local and systemic effects.

Proc 1	EE(inhal): 0.194; EE(derm): 0.034
Proc 2	EE(inhal): 387.2; EE(derm): 1.37
Proc 3	EE(inhal): 484; EE(derm): 0.69
Proc 4	EE(inhal): 193.6; EE(derm): 6.86
Proc 5	EE(inhal): 387.2; EE(derm): 2.742
Proc 8a	EE(inhal): 387.2; EE(derm): 2.742
Proc 8b	EE(inhal): 96.8; EE(derm): 2.742
Proc 10	EE(inhal): 387.2; EE(derm): 2.743
Proc 11	EE(inhal): 203.3; EE(derm): 6.428 - Contributing Scenarios 10 EE(inhal): 193.6; EE(derm): 6.428 - Contributing Scenarios 11 EE(inhal): 290.4; EE(derm): 3.857 - Contributing Scenarios 12
Proc 13	EE(inhal): 232.3; EE(derm): 1.645
Proc 15	EE(inhal): 193.6 ; EE(derm): 0.34
Proc 19	EE(inhal): 135.5; EE(derm): 8.486

Risk characterisation

RCR(inhal): inhalative risk characterisation ratio; RCR(derm): dermal risk characterisation ratio; total RCR= RCR(inhal) +RCR(derm). Where required local and systemic effects were evaluated both for short-term and long-term exposure. The RCR's given correspond in each case to the most conservative calculated values.

Proc 1	RCR(inhal): 0.0003; RCR(derm): 0.003
Proc 2	RCR(inhal): 0.645; RCR(derm): 0.124
Proc 3	RCR(inhal): 0.807; RCR(derm): 0.063
Proc 4	RCR(inhal): 0.323; RCR(derm): 0.624
Proc 5	RCR(inhal): 0.645; RCR(derm): 0.249
Proc 8a	RCR(inhal): 0.645; RCR(derm): 0.249
Proc 8b	RCR(inhal): 0.161; RCR(derm): 0.249
Proc 10	RCR(inhal): 0.645; RCR(derm): 0.249
Proc 11	RCR(inhal): 0.339; RCR(derm): 0.584 - Contributing Scenarios 10 RCR(inhal): 0.323; RCR(derm): 0.584 - Contributing Scenarios 11 RCR(inhal): 0.484; RCR(derm): 0.351 - Contributing Scenarios 12
Proc 13	RCR(inhal): 0.387; RCR(derm): 0.149
Proc 15	RCR(inhal): 0.323; RCR(derm): 0.031
Proc 19	RCR(inhal): 0.226; RCR(derm): 0.772

Number of the ES 5

Short title of the exposure scenario

Use in Cleaning Products

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List of use descriptors

Sector of uses [SU]

SU3: Industrial uses: Uses of substances as such or in preparations at industrial sites
SU8: Manufacture of bulk, large scale chemicals (including petroleum products)

Process categories [PROC]

PROC1: Use in closed process, no likelihood of exposure
PROC2: Use in closed, continuous process with occasional controlled exposure
PROC3: Use in closed batch process (synthesis or formulation)
PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises
PROC7: Industrial spraying
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
PROC10: Roller application or brushing
PROC13: Treatment of articles by dipping and pouring

Environmental release categories [ERC]

ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

Product characteristics

Refer to attached safety data sheets

Processes and activities covered by the exposure scenario

Covers the use as a component of cleaning products including transfer from storage, pouring/unloading from drums or containers. exposures during mixing/diluting in the preparatory phase and cleaning activities (including spraying, brushing, dipping, wiping, automated and by hand), related equipment cleaning and maintenance.

Further explanations

Industrial use
Assumes use at not more than 20°C above ambient temperature (unless stated differently)

Contributing Scenarios

Number of the contributing scenario	1
Contributing exposure scenario controlling environmental exposure for ERC 4	

Further specification

SpERC ESVOC 4.4a.v1 (ESVOC 8), release factors for (Sp)ERC were modified, assessment tool used: Chesar 2.3.

Amounts used

Daily amount per site: 5 to
Annual amount per site: 100 to
Fraction of Regional tonnage used locally: 1

Frequency and duration of use

Covers use up to: 20 days

Environment factors not influenced by risk management

River flow rate: 18000 m³/d Local freshwater dilution factor: 10 Local marine water dilution factor: 100

Technical conditions and measures at process level (source) to prevent release

Release fraction to air from process: 50%
Release fraction to wastewater from process: 0.01 %
Release fraction to soil from process: 0%

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Onsite treatment off-air. Upgrade Systems in place or implement additional treatment. Assumed Efficiency: 50 %

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/ treatment plant (m³/d): 2000
The minimum grade of elimination in the sewage plant is (%): 88.9

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Number of the contributing scenario 2
Contributing exposure scenario controlling worker exposure for PROC 1

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP

Covers percentage substance in the product up to 100 % (unless stated differently)

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 1 hand (240 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

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

Number of the contributing scenario 3
Contributing exposure scenario controlling worker exposure for PROC 2

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP

Covers percentage substance in the product up to 100 % (unless stated differently)

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 2 hands (480 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

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

Number of the contributing scenario 4
Contributing exposure scenario controlling worker exposure for PROC 3

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP

Covers percentage substance in the product up to 100 % (unless stated differently)

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 1 hand (240 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

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

Number of the contributing scenario 5
Contributing exposure scenario controlling worker exposure for PROC 4

Further specification

assessment tool used: Chesar 2.3

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Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP

Covers percentage substance in the product up to 100 % (unless stated differently)

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 2 hands (480 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

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.

Number of the contributing scenario

6

Contributing exposure scenario controlling worker exposure for PROC 7

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP

Covers percentage substance in the product up to 100 % (unless stated differently)

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to hands and lower arms (1500 cm²)

Other given operational conditions affecting workers exposure

Indoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 95 % (inhalative).

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

Number of the contributing scenario

7

Contributing exposure scenario controlling worker exposure for PROC 8a

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP

Covers percentage substance in the product up to 100 % (unless stated differently)

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to 2 hands (960 cm²)

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative). If no adequate ventilation is available, respiratory protection (efficiency 90 %) must be used.

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

Wear suitable gloves tested to EN374.

Number of the contributing scenario

8

Contributing exposure scenario controlling worker exposure for PROC 8b

Further specification

assessment tool used: Chesar 2.3

Product characteristics

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Liquid, vapour pressure 0,5 - 10 kPa at STP
Covers percentage substance in the product up to 100 % (unless stated differently)

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to 2 hands (960 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

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 chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

Number of the contributing scenario

9

Contributing exposure scenario controlling worker exposure for

PROC 10

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP

Covers percentage substance in the product up to 100 % (unless stated differently)

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to 2 hands (960 cm²)

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative). If no adequate ventilation is available, respiratory protection (efficiency 90 %) must be used.

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

Wear suitable gloves tested to EN374.

Number of the contributing scenario

10

Contributing exposure scenario controlling worker exposure for

PROC 13

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP

Covers percentage substance in the product up to 100 % (unless stated differently)

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 2 hands (480 cm²)

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative). If no adequate ventilation is available, respiratory protection (efficiency 90 %) must be used.

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

Wear suitable gloves tested to EN374.

Exposure estimation and reference to its source

Environment

PEC = predicted environmental concentration (local); RCR = risk characterisation ratio

Fresh Water (Pelagic)	PEC: 0.003 mg/l; RCR: 0.017
Fresh Water (Sediment)	PEC: 0.061 mg/kg dw; RCR: 0.062
Marine Water (Pelagic)	PEC: 0.0003 mg/l; RCR: 0.017
Marine Water (Sediment)	PEC: 0.006 mg/kg dw; RCR: 0.062

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Agricultural Soil PEC: 0.016 mg/kg dw; RCR: 0.179
Sewage Treatment Plant (Effluent) PEC: 0.028 mg/l; RCR: 0.0008

Human exposure prediction (oral, dermal, inhalative)

Oral exposure is not expected to occur. EE(inhal): Estimated inhalative long-term exposure [mg/m³]; EE(derm): Estimated dermal long-term exposure [mg/kg b.w./d]. Exposure estimates are given for either short-term or long-term exposure depending on which lead to more conservative risk characterisation ratios. The RMMs described above suffice to control risks for both local and systemic effects.

Proc 1	EE(inhal): 0.194; EE(derm): 0.034
Proc 2	EE(inhal): 96.8; EE(derm): 1.37
Proc 3	EE(inhal): 193.6; EE(derm): 0.69
Proc 4	EE(inhal): 387.2; EE(derm): 1.372
Proc 7	EE(inhal): 242; EE(derm): 4.286
Proc 8a	EE(inhal): 96.8; EE(derm): 2.742
Proc 8b	EE(inhal): 484; EE(derm): 1.372
Proc 10	EE(inhal): 96.8; EE(derm): 5.486
Proc 13	EE(inhal): 96.8; EE(derm): 2.742

Risk characterisation

RCR(inhal): inhalative risk characterisation ratio; RCR(derm): dermal risk characterisation ratio; total RCR= RCR(inhal) +RCR(derm). Where required local and systemic effects were evaluated both for short-term and long-term exposure. The RCR's given correspond in each case to the most conservative calculated values.

Proc 1	RCR(inhal): 0.0003; RCR(derm): 0.003
Proc 2	RCR(inhal): 0.161; RCR(derm): 0.124
Proc 3	RCR(inhal): 0.323; RCR(derm): 0.063
Proc 4	RCR(inhal): 0.645; RCR(derm): 0.125
Proc 7	RCR(inhal): 0.403; RCR(derm): 0.390
Proc 8a	RCR(inhal): 0.161; RCR(derm): 0.249
Proc 8b	RCR(inhal): 0.807; RCR(derm): 0.125
Proc 10	RCR(inhal): 0.161; RCR(derm): 0.499
Proc 13	RCR(inhal): 0.161; RCR(derm): 0.249

Number of the ES 6

Short title of the exposure scenario

Use in Cleaning Products

List of use descriptors

Sector of uses [SU]

SU22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)

Process categories [PROC]

PROC1: Use in closed process, no likelihood of exposure

PROC2: Use in closed, continuous process with occasional controlled exposure

PROC3: Use in closed batch process (synthesis or formulation)

PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises

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

PROC10: Roller application or brushing

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PROC11: Non industrial spraying
PROC13: Treatment of articles by dipping and pouring

Environmental release categories [ERC]

ERC8a: Wide dispersive indoor use of processing aids in open systems

Product characteristics

Refer to attached safety data sheets

Processes and activities covered by the exposure scenario

Covers the use as a component of cleaning products including pouring/unloading from drums or containers; and exposures during mixing/diluting in the preparatory phase and cleaning activities (including spraying, brushing, dipping, wiping, automated and by hand).

Further explanations

Professional use

Assumes use at not more than 20°C above ambient temperature (unless stated differently)

Assumes a basic standard of occupational Health and Safety Management System

Contributing Scenarios

Number of the contributing scenario	1
Contributing exposure scenario controlling environmental exposure for ERC 8a	

Further specification

SpERC ESVOC 8.4b.v1 (ESVOC 9),
assessment tool used: Chesar 2.3.

Amounts used

daily wide dispersive use: 0.0003 to/d
Fraction of EU tonnage used in region: 0.1
Fraction of Regional tonnage used locally: 0.0005
Amounts used (EU): 2000 to/a

Environment factors not influenced by risk management

River flow rate: 18000 m³/d Local freshwater dilution factor: 10 Local marine water dilution factor: 100

Other given operational conditions affecting environmental exposure

Indoor/Outdoor use

Technical conditions and measures at process level (source) to prevent release

Release fraction to air from wide dispersive use (regional only): 2 %
Release fraction to wastewater from wide dispersive use: 0.0001 %
Release fraction to soil from wide dispersive use (regional only): 0%

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/ treatment plant (m³/d): 2000
The minimum grade of elimination in the sewage plant is (%): 88.9

Number of the contributing scenario	2
Contributing exposure scenario controlling worker exposure for PROC 1, PROC 3	

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP
Covers percentage substance in the product up to 100 % (unless stated differently)

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 1 hand (240 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

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Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour).

Number of the contributing scenario 3
Contributing exposure scenario controlling worker exposure for PROC 2

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP

Covers percentage substance in the product up to 100 % (unless stated differently)

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 2 hands (480 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour).

Number of the contributing scenario 4
Contributing exposure scenario controlling worker exposure for PROC 4

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Covers percentage substance in the product up to 5 %

Liquid, vapour pressure 0,5 - 10 kPa at STP

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 2 hands (480 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour).

Number of the contributing scenario 5
Contributing exposure scenario controlling worker exposure for PROC 4

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Covers percentage substance in the product up to 25 %

Liquid, vapour pressure 0,5 - 10 kPa at STP

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 2 hands (480 cm²)

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

Wear suitable gloves tested to EN374.

Number of the contributing scenario 6
Contributing exposure scenario controlling worker exposure for PROC 4

Further specification

assessment tool used: Chesar 2.3

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Product characteristics

Covers percentage substance in the product up to 100 % (unless stated differently)

Liquid, vapour pressure 0,5 - 10 kPa at STP

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 2 hands (480 cm²)

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative). If no adequate ventilation is available, respiratory protection (efficiency 90 %) must be used.

Number of the contributing scenario

7

Contributing exposure scenario controlling worker exposure for PROC 8a

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Covers percentage substance in the product up to 5 %

Liquid, vapour pressure 0,5 - 10 kPa at STP

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to 2 hands (960 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

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

Number of the contributing scenario

8

Contributing exposure scenario controlling worker exposure for PROC 8a

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Covers percentage substance in the product up to 100 % (unless stated differently)

Liquid, vapour pressure 0,5 - 10 kPa at STP

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to 2 hands (960 cm²)

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative). If no adequate ventilation is available, respiratory protection (efficiency 90 %) must be used.

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

Wear suitable gloves tested to EN374.

Number of the contributing scenario

9

Contributing exposure scenario controlling worker exposure for PROC 8b

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Covers percentage substance in the product up to 5 %

Liquid, vapour pressure 0,5 - 10 kPa at STP

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

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Area potentially exposed: corresponds to 2 hands (960 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

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

Number of the contributing scenario

10

Contributing exposure scenario controlling worker exposure for PROC 8b

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Covers percentage substance in the product up to 25 %

Liquid, vapour pressure 0,5 - 10 kPa at STP

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to 2 hands (960 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

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

Wear suitable gloves tested to EN374.

Number of the contributing scenario

11

Contributing exposure scenario controlling worker exposure for PROC 8b

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Covers percentage substance in the product up to 100 % (unless stated differently)

Liquid, vapour pressure 0,5 - 10 kPa at STP

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to 2 hands (960 cm²)

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative). If no adequate ventilation is available, respiratory protection (efficiency 90 %) must be used.

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

Wear suitable gloves tested to EN374.

Number of the contributing scenario

12

Contributing exposure scenario controlling worker exposure for PROC 10

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Covers percentage substance in the product up to 5 %

Liquid, vapour pressure 0,5 - 10 kPa at STP

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to 2 hands (960 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

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

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Wear suitable gloves tested to EN374.

Number of the contributing scenario 13
Contributing exposure scenario controlling worker exposure for PROC 10

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Covers percentage substance in the product up to 100 % (unless stated differently)

Liquid, vapour pressure 0,5 - 10 kPa at STP

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to 2 hands (960 cm²)

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative). If no adequate ventilation is available, respiratory protection (efficiency 90 %) must be used.

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

Number of the contributing scenario 14
Contributing exposure scenario controlling worker exposure for PROC 11

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Covers percentage substance in the product up to 5 %

Liquid, vapour pressure 0,5 - 10 kPa at STP

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to hands and lower arms (1500 cm²)

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative). If no adequate ventilation is available, respiratory protection (efficiency 90 %) must be used.

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

Number of the contributing scenario 15
Contributing exposure scenario controlling worker exposure for PROC 13

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Covers percentage substance in the product up to 25 %

Liquid, vapour pressure 0,5 - 10 kPa at STP

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 2 hands (480 cm²)

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative). If no adequate ventilation is available, respiratory protection (efficiency 90 %) must be used.

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

Wear suitable gloves tested to EN374.

Number of the contributing scenario 16

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Contributing exposure scenario controlling worker exposure for PROC 13

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Covers percentage substance in the product up to 5 %

Liquid, vapour pressure 0,5 - 10 kPa at STP

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 2 hands (480 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

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

Exposure estimation and reference to its source

Environment

PEC = predicted environmental concentration (local); RCR = risk characterisation ratio

Fresh Water (Pelagic)	PEC: 0.0003 mg/l; RCR: 0.0002
Fresh Water (Sediment)	PEC: 0.005 mg/kg dw; RCR: 0.006
Marine Water (Pelagic)	PEC: 0.00002 mg/l; RCR: 0.001
Marine Water (Sediment)	PEC: 0.0005 mg/kg dw; RCR: 0.005
Agricultural Soil	PEC: 0.00004 mg/kg dw; RCR: 0.0004
Sewage Treatment Plant (Effluent)	PEC: 0.0000 mg/l; RCR: 0.0000

Human exposure prediction (oral, dermal, inhalative)

Oral exposure is not expected to occur. EE(inhal): Estimated inhalative long-term exposure [mg/m³]; EE(derm): Estimated dermal long-term exposure [mg/kg b.w./d]. Exposure estimates are given for either short-term or long-term exposure depending on which lead to more conservative risk characterisation ratios. The RMMs described above suffice to control risks for both local and systemic effects.

Proc 1	EE(inhal): 0.194; EE(derm): 0.034
Proc 2	EE(inhal): 387.2; EE(derm): 1.37
Proc 3	EE(inhal): 484; EE(derm): 0.69
Proc 4	EE(inhal): 193.6; EE(derm): 1.372 - Contributing Scenarios 4 EE(inhal): 406.6; EE(derm): 0.823 - Contributing Scenarios 5 EE(inhal): 193.6; EE(derm): 6.86 - Contributing Scenarios 6
Proc 8a	EE(inhal): 387.2; EE(derm): 2.742 - Contributing Scenarios 7 EE(inhal): 387.2; EE(derm): 2.742 - Contributing Scenarios 8
Proc 8b	EE(inhal): 193.6; EE(derm): 2.742 - Contributing Scenarios 9 EE(inhal): 406.6 ; EE(derm): 1.645 - Contributing Scenarios 10 EE(inhal): 96.8 ; EE(derm): 2.742 - Contributing Scenarios 11
Proc 10	EE(inhal): 387.2; EE(derm): 1.097 - Contributing Scenarios 12 EE(inhal): 387.2; EE(derm): 2.743 - Contributing Scenarios 13
Proc 11	EE(inhal): 387.2 ; EE(derm): 2.143
Proc 13	EE(inhal): 232.3 ; EE(derm): 1.645 - Contributing Scenarios 15 EE(inhal): 387.2 ; EE(derm): 2.742 - Contributing Scenarios 16

Risk characterisation

RCR(inhal): inhalative risk characterisation ratio; RCR(derm): dermal risk characterisation ratio; total RCR= RCR(inhal) +RCR(derm). Where required local and systemic effects were evaluated both for short-term and long-term exposure. The RCR's given correspond in each case to the most conservative calculated values.

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Proc 1	RCR(inhal): 0.0003; RCR(derm): 0.003
Proc 2	RCR(inhal): 0.645; RCR(derm): 0.124
Proc 3	RCR(inhal): 0.807; RCR(derm): 0.063
Proc 4	RCR(inhal): 0.323; RCR(derm): 0.125 - Contributing Scenarios 4 RCR(inhal): 0.678; RCR(derm): 0.075 - Contributing Scenarios 5 RCR(inhal): 0.323; RCR(derm): 0.624 - Contributing Scenarios 6
Proc 8a	RCR(inhal): 0.645; RCR(derm): 0.249 - Contributing Scenarios 7 RCR(inhal): 0.645; RCR(derm): 0.249 - Contributing Scenarios 8
Proc 8b	RCR(inhal): 0.323; RCR(derm): 0.249 - Contributing Scenarios 9 RCR(inhal): 0.678; RCR(derm): 0.149 - Contributing Scenarios 10
Proc 10	RCR(inhal): 0.161; RCR(derm): 0.249 - Contributing Scenarios 11 RCR(inhal): 0.645; RCR(derm): 0.100 - Contributing Scenarios 12 RCR(inhal): 0.645; RCR(derm): 0.249 - Contributing Scenarios 13
Proc 11	RCR(inhal): 0.645; RCR(derm): 0.195
Proc 13	RCR(inhal): 0.387; RCR(derm): 0.149 - Contributing Scenarios 15 RCR(inhal): 0.645; RCR(derm): 0.249 - Contributing Scenarios 16

Number of the ES 7

Short title of the exposure scenario

Use in laboratories

List of use descriptors

Sector of uses [SU]

SU3: Industrial uses: Uses of substances as such or in preparations at industrial sites

Process categories [PROC]

PROC10: Roller application or brushing

PROC15: Use as laboratory reagent

Environmental release categories [ERC]

ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

Product characteristics

Refer to attached safety data sheets

Processes and activities covered by the exposure scenario

Use of the substance within laboratory settings, including material transfers and equipment cleaning

Further explanations

Industrial use

Assumes use at not more than 20°C above ambient temperature (unless stated differently)

Contributing Scenarios

Number of the contributing scenario

1

Contributing exposure scenario controlling environmental exposure for ERC 4

Further specification

assessment tool used: Chesar 2.3.

Amounts used

Daily amount per site: 0.05 to

Annual amount per site: 1 to

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Fraction of Regional tonnage used locally: 1

Environment factors not influenced by risk management

River flow rate: 18000 m³/d Local freshwater dilution factor: 10 Local marine water dilution factor: 100

Technical conditions and measures at process level (source) to prevent release

Release fraction to air from process: 100 %

Release fraction to wastewater from process: 10 %

Release fraction to soil from process: 5%

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Onsite treatment wastewater. Apply acclimated biological treatment. Assumed Efficiency: 90 %

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/ treatment plant (m³/d): 2000

The minimum grade of elimination in the sewage plant is (%): 88.9

Do not apply industrial sludge to natural soils

Number of the contributing scenario 2
Contributing exposure scenario controlling worker exposure for PROC 10

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP

Covers percentage substance in the product up to 100 % (unless stated differently)

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to 2 hands (960 cm²)

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative). If no adequate ventilation is available, respiratory protection (efficiency 90 %) must be used.

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

Wear suitable gloves tested to EN374.

Number of the contributing scenario 3
Contributing exposure scenario controlling worker exposure for PROC 15

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Covers percentage substance in the product up to 100 % (unless stated differently)

Liquid, vapour pressure 0,5 - 10 kPa at STP

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 1 hand (240 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Exposure estimation and reference to its source

Environment

PEC = predicted environmental concentration (local); RCR = risk characterisation ratio

Fresh Water (Pelagic)	PEC: 0.028 mg/l; RCR: 0.156
Fresh Water (Sediment)	PEC: 0.564 mg/kg dw; RCR: 0.575
Marine Water (Pelagic)	PEC: 0.003 mg/l; RCR: 0.156
Marine Water (Sediment)	PEC: 0.056 mg/kg dw; RCR: 0.574
Agricultural Soil	PEC: 0.0002 mg/kg dw; RCR: 0.002
Sewage Treatment Plant	PEC: 0.279 mg/l; RCR: 0.008

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(Effluent)

Human exposure prediction (oral, dermal, inhalative)

Oral exposure is not expected to occur. EE(inhal): Estimated inhalative long-term exposure [mg/m³]; EE(derm): Estimated dermal long-term exposure [mg/kg b.w./d]. Exposure estimates are given for either short-term or long-term exposure depending on which lead to more conservative risk characterisation ratios. The RMMs described above suffice to control risks for both local and systemic effects.

Proc 10	EE(inhal):	96.8; EE(derm):	5.486
Proc 15	EE(inhal):	193.6; EE(derm):	0.34

Risk characterisation

RCR(inhal): inhalative risk characterisation ratio; RCR(derm): dermal risk characterisation ratio; total RCR= RCR(inhal) +RCR(derm). Where required local and systemic effects were evaluated both for short-term and long-term exposure. The RCR's given correspond in each case to the most conservative calculated values.

Proc 10	RCR(inhal):	0.161; RCR(derm):	0.499
Proc 15	RCR(inhal):	0.323; RCR(derm):	0.031

Number of the ES 8

Short title of the exposure scenario

Use in laboratories

List of use descriptors

Sector of uses [SU]

SU22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)

Process categories [PROC]

PROC10: Roller application or brushing
PROC15: Use as laboratory reagent

Environmental release categories [ERC]

ERC8a: Wide dispersive indoor use of processing aids in open systems

Product characteristics

Refer to attached safety data sheets

Processes and activities covered by the exposure scenario

Use of small quantities within laboratory settings, including material transfers and equipment cleaning

Further explanations

Professional use

Assumes use at not more than 20°C above ambient temperature (unless stated differently)

Assumes a basic standard of occupational Health and Safety Management System

Contributing Scenarios

Number of the contributing scenario

1

**Contributing exposure scenario controlling environmental exposure for
ERC 8a**

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Further specification

SpERC ESVOC 8.17.v1 (ESVOC 39),
assessment tool used: Chesar 2.3.

Amounts used

daily wide dispersive use: 0.0000001 to/d
Fraction of EU tonnage used in region: 0.1
Fraction of Regional tonnage used locally: 0.0005
Amounts used (EU): 1 to/a

Environment factors not influenced by risk management

River flow rate: 18000 m³/d Local freshwater dilution factor: 10 Local marine water dilution factor: 100

Other given operational conditions affecting environmental exposure

Indoor/Outdoor use

Technical conditions and measures at process level (source) to prevent release

Release fraction to air from process: 50 %
Release fraction to wastewater from process: 50 %
Release fraction to soil from process: 0%

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/ treatment plant (m³/d): 2000
The minimum grade of elimination in the sewage plant is (%): 88.9

Number of the contributing scenario

2

Contributing exposure scenario controlling worker exposure for PROC 10

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Covers percentage substance in the product up to 100 % (unless stated differently)
Liquid, vapour pressure 0,5 - 10 kPa at STP

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to 2 hands (960 cm²)

Technical conditions and measures to control dispersion from source towards the worker

provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative). If no adequate ventilation is available, respiratory protection (efficiency 90 %) must be used.

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

Wear suitable gloves tested to EN374.

Number of the contributing scenario

3

Contributing exposure scenario controlling worker exposure for PROC 15

Further specification

assessment tool used: Chesar 2.3

Product characteristics

Liquid, vapour pressure 0,5 - 10 kPa at STP
Covers percentage substance in the product up to 100 % (unless stated differently)

Frequency and duration of use

8 h (full shift)

Human factors not influenced by risk management

Area potentially exposed: corresponds to palm of 1 hand (240 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

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

Exposure estimation and reference to its source

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Environment

PEC = predicted environmental concentration (local); RCR = risk characterisation ratio

Fresh Water (Pelagic)	PEC: 0.00027 mg/l; RCR: 0.002
Fresh Water (Sediment)	PEC: 0.005 mg/kg dw; RCR: 0.006
Marine Water (Pelagic)	PEC: 0.00002 mg/l; RCR: 0.001
Marine Water (Sediment)	PEC: 0.0005 mg/kg dw; RCR: 0.005
Agricultural Soil	PEC: 0.00004 mg/kg dw; RCR: 0.0004
Sewage Treatment Plant (Effluent)	PEC: 0.0000 mg/l; RCR: 0.0000

Human exposure prediction (oral, dermal, inhalative)

Oral exposure is not expected to occur. EE(inhal): Estimated inhalative long-term exposure [mg/m³]; EE(derm): Estimated dermal long-term exposure [mg/kg b.w./d]. Exposure estimates are given for either short-term or long-term exposure depending on which lead to more conservative risk characterisation ratios. The RMMs described above suffice to control risks for both local and systemic effects.

Proc 10	EE(inhal):	271 ; EE(derm):	5.486
Proc 15	EE(inhal):	193.6 ; EE(derm):	0.34

Risk characterisation

RCR(inhal): inhalative risk characterisation ratio; RCR(derm): dermal risk characterisation ratio; total RCR= RCR(inhal) +RCR(derm). Where required local and systemic effects were evaluated both for short-term and long-term exposure. The RCR's given correspond in each case to the most conservative calculated values.

Proc 10	RCR(inhal):	0.452; RCR(derm):	0.499
Proc 15	RCR(inhal):	0.323; RCR(derm):	0.031