

SAFETY DATA SHEET



Isononanoic acid
10310

Version / Revision
Supersedes Version

4.01
4.00***

Revision Date
Issuing date

30-Oct-2018
30-Oct-2018

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

1.1. Product identifier

Identification of the
substance/preparation

Isononanoic acid

Chemical Name 3,5,5-Trimethylhexanoic acid
CAS-No 3302-10-1
EC No. 221-975-0
Registration number (REACH) 01-2119517580-45

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

Identified uses Intermediate
Formulation
Distribution of substance
Functional Fluids
Lubricants and lubricant additives
Metal working fluids / rolling oils
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)

Acute oral toxicity Category 4, H302
Skin corrosion/irritation Category 2, H315
Serious eye damage/eye irritation Category 1, H318

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Additional information

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

2.2. Label elements

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

Hazard pictograms



Signal word

Danger

Hazard statements

H302: Harmful if swallowed.
H315: Causes skin irritation.
H318: Causes serious eye damage.

Precautionary statements

P280: Wear protective gloves/protective clothing/eye protection/face protection.
P301 + P330: IF SWALLOWED: Rinse mouth
P302 + P352: IF ON SKIN: Wash with plenty of soap and water.
P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310: Immediately call a POISON CENTER/doctor.

2.3. Other hazards

Vapour/air-mixtures are explosive at intense warming

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	RECh-No	1272/2008/EC	Concentration (%)
3,5,5-Trimethylhexanoic acid	3302-10-1	01-2119517580-45	Acute Tox. 4; H302 Skin Irrit. 2; H315 Eye Dam. 1; H318	88 - 100

Remarks

Mixture of isomeric Isononanoic acids, mainly 3,5,5-Trimethylhexanoic acid.
For full text of Hazard- and EU Hazard-statements see SECTION 16.

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation

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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, headache, nausea, shortness of breath.

Special hazard

Lung irritation, Lung oedema.

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. If ingested, flush stomach and compensate acidosis.

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/air-mixtures are explosive at intense warming

Vapours are heavier than air and may spread along floors

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.

Precautions for firefighting

Cool containers / tanks with water spray. Water run-off and vapor cloud may be corrosive. Dike and collect water

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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

bases
amines

7.2. Conditions for safe storage, including any incompatibilities

Advice on protection against fire and explosion

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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/air-mixtures are explosive at intense warming.

Technical measures/Storage conditions

Keep containers tightly closed in a cool, well-ventilated place. Handle and open container with care. Keep at temperatures between 0 and 38 °C (32 and 100 °F).

Suitable material

stainless steel

Unsuitable material

mild steel, copper, brass, including their alloys

Temperature class

T2

7.3. Specific end use(s)

Intermediate

Formulation

Distribution of substance

Functional Fluids

Lubricants and lubricant additives

Metal working fluids / rolling oils

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

No exposure limits established.

DNEL & PNEC

3,5,5-Trimethylhexanoic acid, CAS: 3302-10-1

Workers

DN(M)EL - long-term exposure - systemic effects - Inhalation	7 mg/m ³
DN(M)EL - acute / short-term exposure - systemic effects - Inhalation	No hazard identified
DN(M)EL - long-term exposure - local effects - Inhalation	No hazard identified
DN(M)EL - acute / short-term exposure - local effects - Inhalation	No hazard identified
DN(M)EL - long-term exposure - systemic effects - Dermal	3*** mg/kg bw/day***
DN(M)EL - acute / short-term exposure - systemic effects - Dermal	No hazard identified

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DN(M)EL - long-term exposure - local effects - Dermal	Low hazard (no threshold derived)
DN(M)EL - acute / short-term exposure - local effects - Dermal	Low hazard (no threshold derived)
DN(M)EL - local effects - eyes	Medium hazard (no threshold derived)

General population

DN(M)EL - long-term exposure - systemic effects - Inhalation	2,6*** mg/m ³
DN(M)EL - acute / short-term exposure - systemic effects - Inhalation	No hazard identified
DN(M)EL - long-term exposure - local effects - Inhalation	No hazard identified
DN(M)EL - acute / short-term exposure - local effects - Inhalation	No hazard identified
DN(M)EL - long-term exposure - systemic effects - Dermal	1,5*** mg/kg bw/day
DN(M)EL - acute / short-term exposure - systemic effects - Dermal	No hazard identified
DN(M)EL - long-term exposure - local effects - Dermal	Low hazard (no threshold derived)
DN(M)EL - acute / short-term exposure - local effects - Dermal	Low hazard (no threshold derived)
DN(M)EL - long-term exposure - systemic effects - Oral	1,5*** mg/kg bw/day
DN(M)EL - acute / short-term exposure - systemic effects - Oral	Low hazard (no threshold derived)
DN(M)EL - local effects - eyes	Medium hazard (no threshold derived)

Environment

PNEC aqua - freshwater	0,068 mg/l
PNEC aqua - marine water	0,0068*** mg/l
PNEC aqua - intermittent releases	1,36 mg/l
PNEC STP	23 mg/l
PNEC sediment - freshwater	0,904 mg/kg
PNEC sediment - marine water	0,0904*** mg/kg
PNEC Air	No hazard identified
PNEC soil	0,141 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.

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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.

Eye protection

Safety glasses with side-shields. 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	nitrile rubber
Evaluation	according to EN 374: level 6
Glove thickness	approx 0,55 mm
Break through time	> 480 min
Suitable material	polyvinylchloride
Evaluation	Information derived from practical experience
Glove thickness	approx 0.8 mm

Skin and body protection

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

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 @ 20 °C (68 °F)
Colour	colourless
Odour	slightly acidic
Odour threshold	No data available
pH	4,4 (0,1 g/l in water @ 20 °C (68 °F)) DIN 19268
Melting point/range	approx. -77 °C (Pour point)
Method	DIN ISO 3016
Boiling point/range	236 °C @ 1013 hPa
Method	OECD 103
Flash point	117 °C
Method	ISO 2719, @ 1013 hPa
Evaporation rate	No data available
Flammability (solid, gas)	Does not apply, the substance is a liquid
Lower explosion limit	1,2 Vol %

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Upper explosion limit No data available

Vapour pressure

Values [hPa]	Values [kPa]	Values [atm]	@ °C	@ °F	Method
0,0046	0,00046	< 0,001	20	68	
4,5	0,45	0,004	50	122	

Vapour density No data available

Relative density

Values	@ °C	@ °F	Method
0,900	20	68	DIN 51757
0,876	50	122	DIN 51757

Solubility 0,7 g/l @ 20 °C, in water, OECD 105

log Pow 3,2 (measured), OECD 117

Autoignition temperature 320 - 415 °C

Method DIN 51794 @ 1009 hPa

Decomposition temperature No data available

Viscosity 11,47 mPa*s @ 20 °C

Method DIN 51562, dynamic

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 158,23

Molecular formula C₉H₁₈O₂

log Koc 2,9 @ pH 4 , 1,99 @ pH 7, calculated

Dissoziation constant pKa not determinable due to low water solubility @ 20°C (68°F) OECD 112

Refractive index 1,429 @ 20 °C

Surface tension 35,3 mN/m (0,63 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

Hazardous polymerisation does not occur.

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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bases, amines.

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				
3,5,5-Trimethylhexanoic acid (3302-10-1)				
Routes of Exposure	Endpoint	Values	Species	Method
Oral	LD50	1160 mg/kg	rat, male/female	OECD 401
Dermal	LD50	> 2000 mg/kg	rat, male/female	read across

3,5,5-Trimethylhexanoic acid, CAS: 3302-10-1

Assessment

The available data lead to the classification given in section 2
For acute inhalation toxicity, no data are available

Irritation and corrosion				
3,5,5-Trimethylhexanoic acid (3302-10-1)				
Target Organ Effects	Species	Result	Method	
Skin	rabbit	irritating	OECD 404	in vivo
Eyes	rabbit	severe irritation	OECD 405	in vivo

3,5,5-Trimethylhexanoic acid, CAS: 3302-10-1

Assessment

The available data lead to the classification given in section 2
For respiratory irritation, no data are available

Sensitization				
3,5,5-Trimethylhexanoic acid (3302-10-1)				
Target Organ Effects	Species	Evaluation	Method	
Skin	guinea pig	not sensitizing	OECD 406	read across

3,5,5-Trimethylhexanoic acid, CAS: 3302-10-1

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				
3,5,5-Trimethylhexanoic acid (3302-10-1)				
Type	Dose	Species	Method	
Subacute toxicity	LOAEL: 200 mg/kg/d (28d)	rat, male/female	OECD 407	Oral

3,5,5-Trimethylhexanoic acid, CAS: 3302-10-1

Assessment

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

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STOT RE

Carcinogenicity, Mutagenicity, Reproductive toxicity					
3,5,5-Trimethylhexanoic acid (3302-10-1)					
Type	Dose	Species	Evaluation	Method	
Mutagenicity		Salmonella typhimurium	negative	OECD 471 (Ames)	In vitro study
Mutagenicity		Escherichia coli	negative	OECD 472	In vitro study
Mutagenicity		CHO (Chinese Hamster Ovary) cells	ambiguous	OECD 473 (Chromosomal Aberration)	In vitro study
Mutagenicity		V79 cells, Chinese hamster	negative	OECD 476 (Mammalian Gene Mutation)	In vitro study
Reproductive toxicity	LOAEL 165 - 500 mg/kg/d	rat, parental, female		OECD 415	Oral
Reproductive toxicity	NOAEL 79 - 228 mg/kg/d	rat, parental, female		OECD 415	Oral
Developmental Toxicity	NOAEL 60 mg/kg/d	rat		OECD 414, Oral	Oral

3,5,5-Trimethylhexanoic acid, CAS: 3302-10-1

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***

3,5,5-Trimethylhexanoic acid, CAS: 3302-10-1

Main symptoms

cough, headache, nausea, shortness of breath.

Target Organ Systemic Toxicant - Single exposure

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

Target Organ Systemic Toxicant - Repeated exposure

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

Aspiration toxicity

no data available***

Note

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			
3,5,5-Trimethylhexanoic acid (3302-10-1)			
Species	Exposure time	Dose	Method
Oncorhynchus mykiss (rainbow trout)	96h	LC50: 123 mg/l	OECD 203

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Activated sludge (bacteriae)	3 h	EC50: 470 mg/l	OECD 209
Daphnia magna (Water flea)	48h	EC50: 68 mg/l	OECD 202
Pseudokirchneriella subcapitata	72h	EC50: 81 mg/l (Growth rate)	OECD 201
Pseudokirchneriella subcapitata	72h	EC50: 51 mg/l (Biomass)	OECD 201

Long term toxicity

3,5,5-Trimethylhexanoic acid (3302-10-1)

Type	Species	Dose	Method
Aquatic toxicity	Pseudokirchneriella subcapitata	NOEC: 10 mg/l	OECD 201

12.2. Persistence and degradability

3,5,5-Trimethylhexanoic acid, CAS: 3302-10-1

Biodegradation

96 % (21*** d), activated sludge, domestic, non-adapted, aerobic, OECD 301 A / ISO 7827.***

Abiotic Degradation

3,5,5-Trimethylhexanoic acid (3302-10-1)

Type	Result	Method
Hydrolysis	No data available	
Photolysis	Rate constant: $0,52 \cdot 10^{-11}$ cm ³ /(molecule x s)	calculated

12.3. Bioaccumulative potential

3,5,5-Trimethylhexanoic acid (3302-10-1)

Type	Result	Method
log Pow	3,2	measured, OECD 117
BCF	3,1 - 7 @ 0,1 mg/l	OECD 305 C
BCF	0,5 - 1,7 @ 1 mg/l	OECD 305 C

12.4. Mobility in soil

3,5,5-Trimethylhexanoic acid (3302-10-1)

Type	Result	Method
Surface tension	35,3 mN/m (0,63 g/l @ 20°C (68°F))	OECD 115
Distribution to environmental compartments	Soil: 12,6 %	calculated
Adsorption/Desorption	log Koc: 2,9 @ pH 4	calculated
Adsorption/Desorption	log Koc: 1,99 @ pH 7	calculated

12.5. Results of PBT and vPvB assessment

3,5,5-Trimethylhexanoic acid, CAS: 3302-10-1

PBT and vPvB assessment

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

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12.6. Other adverse effects

3,5,5-Trimethylhexanoic acid, CAS: 3302-10-1

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

Section 14.1 - 14.6

ADR/RID

Not restricted

ADN

ADN Container
Not restricted

ADN

ADN Tanker

14.1. UN number

ID 9006

14.2. UN proper shipping name

Environmentally hazardous substance, liquid, n.o.s.

14.3. Transport hazard class(es)

9

Subsidiary Risk

N3, F

14.4. Packing group

-

14.5. Environmental hazards

Fish and tree

14.6. Special precautions for user

no data available

ICAO-TI / IATA-DGR

Not restricted

IMDG

Not restricted

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code

Product name

Nonanoic acid

Ship type

3

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Pollution category Y

SECTION 15: Regulatory information

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

Regulation 1272/2008, Annex VI

not listed

DI 2012/18/EU (Seveso III)

Category not subject

DI 1999/13/EC (VOC Guideline)

Component	Status
3,5,5-Trimethylhexanoic acid CAS: 3302-10-1	not subject

International Inventories

3,5,5-Trimethylhexanoic acid, CAS: 3302-10-1

AICS (AU)^{***}
DSL (CA)^{***}
IECSC (CN)^{***}
EC-No. 2219750 (EU)^{***}
ENCS (2)-608 (JP)^{***}
ISHL (2)-608 (JP)^{***}
KECI KE-34559 (KR)^{***}
PICCS (PH)^{***}
TSCA (US)^{***}
NZIoC-NZ May be used as single component chemical^{***}
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^{***}

15.2. Chemical safety assessment

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

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SECTION 16: Other information

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

H302: Harmful if swallowed.
H315: Causes skin irritation.
H318: Causes serious eye damage.

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:
Qualitative approach used to conclude safe use.

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

Other combinations of operational conditions may also be safe. Please contact Oxea in case your local operational conditions differ from the ones described below and you are unsure if they are also safe

Operational conditions and risk management measures

Wear suitable gloves tested to EN 374 for activities, where direct contact with substance is possible. Wear suitable eye protection, where direct contact (e.g. splashes) with substance is possible.

Exposure scenario identification

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- 1 Industrial use resulting in manufacture of another substance (use of intermediates)
- 2 Formulation & (re)packing of substances and mixtures
- 3 Distribution of substance
- 4 Functional Fluids
- 5 Functional Fluids
- 6 lubricants
- 7 lubricants
- 8 Metal working fluids / rolling oils
- 9 Metal working fluids / rolling oils
- 10 Use in laboratories
- 11 Use in laboratories

Number of the ES 1

Short title of the exposure scenario

Industrial use resulting in manufacture of another substance (use of intermediates)

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
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
PROC15: Use as laboratory reagent

Environmental release categories [ERC]

ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)

Product characteristics

Refer to attached safety data sheets

Processes and activities covered by the exposure scenario

Use as an intermediate (not related to Strictly Controlled Conditions). Includes incidental exposures during recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).

Further explanations

Industrial use

Contributing Scenarios

Number of the contributing scenario

1

Contributing exposure scenario controlling environmental exposure for ERC 6a

Further specification

SpERC ESVOC 6.1a.v1 (ESVOC 2)

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assessment tool used: Chesar 1.1.3

Amounts used

Daily amount per site: 3 to

Annual amount per site: 500 to

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: 0 %

Release fraction to wastewater from process: 0.3 %

Release fraction to soil from process: 0.1%

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 (%): 87.5

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

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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

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

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

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

Liquid, vapour pressure < 0,5 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 palm of 2 hands (480 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 4
Contributing exposure scenario controlling worker exposure for PROC 3

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

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

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Liquid, vapour pressure < 0,5 kPa at STP

Frequency and duration of use

Avoid carrying out activities involving exposure for more than 1 hour

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

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

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

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

Liquid, vapour pressure < 0,5 kPa at STP

Frequency and duration of use

Avoid carrying out activities involving exposure for more than 15 minutes

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

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 6
Contributing exposure scenario controlling worker exposure for PROC 8a

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

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

Liquid, vapour pressure < 0,5 kPa at STP

Frequency and duration of use

Avoid carrying out activities involving exposure for more than 1 hour

Human factors not influenced by risk management

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

Other given operational conditions affecting workers exposure

Indoor use

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

Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 99 % (dermal).

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 8b

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

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

Liquid, vapour pressure < 0,5 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

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Area potentially exposed: corresponds to palm of 2 hands (480 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. Wear respiratory protection (Efficiency: 90 %).

Number of the contributing scenario

8

Contributing exposure scenario controlling worker exposure for PROC 15

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

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

Liquid, vapour pressure < 0,5 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 use

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

Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 90 % (dermal).

Exposure estimation and reference to its source

Environment

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

Fresh Water (Pelagic)	PEC: 0.056 mg/l; RCR: 0.831
Fresh Water (Sediment)	PEC: 0.752 mg/kg dw; RCR: 0.832
Marine Water (Pelagic)	PEC: 0.006 mg/l; RCR: 0.831
Marine Water (Sediment)	PEC: 0.075 mg/kg dw; RCR: 0.832
Agricultural Soil	PEC: 0.12 mg/kg dw; RCR: 0.851
Sewage Treatment Plant (Effluent)	PEC: 0.563 mg/l; RCR: 0.024

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].

Proc 1	EE(inhal): 0.066 ; EE(derm): 0.343
Proc 2	EE(inhal): 3.956 ; EE(derm): 0.274
Proc 3	EE(inhal): 3.956 ; EE(derm): 0.343
Proc 4	EE(inhal): 3.297 ; EE(derm): 0.686
Proc 8a	EE(inhal): 1.319 ; EE(derm): 0.014
Proc 8b	EE(inhal): 1.978 ; EE(derm): 1.371
Proc 15	EE(inhal): 3.297 ; EE(derm): 0.034

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): 0.009 ; RCR(derm): 0.171
Proc 2	RCR(inhal): 0.565 ; RCR(derm): 0.137
Proc 3	RCR(inhal): 0.565 ; RCR(derm): 0.171
Proc 4	RCR(inhal): 0.471 ; RCR(derm): 0.343
Proc 8a	RCR(inhal): 0.188 ; RCR(derm): 0.007
Proc 8b	RCR(inhal): 0.283 ; RCR(derm): 0.686
Proc 15	RCR(inhal): 0.471 ; RCR(derm): 0.017

Number of the ES 2

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]

ERC3: Formulation in materials

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, maintenance and associated laboratory activities.

Further explanations

Industrial use

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),

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assessment tool used: Chesar 1.1.3.

Amounts used

Daily amount per site: 5 to

Annual amount per site: 800 to

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: 0.25 %

Release fraction to wastewater from process: 0.2 %

Release fraction to soil from process: 0.01%

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 (%): 87.5

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

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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

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

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 palm of 2 hands (480 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 4
Contributing exposure scenario controlling worker exposure for PROC 3

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 kPa at STP

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

Frequency and duration of use

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Avoid carrying out activities involving exposure for more than 1 hour

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

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

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 15 minutes

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

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 6
Contributing exposure scenario controlling worker exposure for PROC 5

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 15 minutes

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

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.

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

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 1 hour

Human factors not influenced by risk management

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

Other given operational conditions affecting workers exposure

Indoor use

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

Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative);

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99 % (dermal).

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 8b

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 palm of 2 hands (480 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. Wear respiratory protection (Efficiency: 90 %).

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

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 palm of 2 hands (480 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. Wear respiratory protection (Efficiency: 90 %).

Number of the contributing scenario 10
Contributing exposure scenario controlling worker exposure for PROC 14

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 palm of 2 hands (480 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. Wear respiratory protection (Efficiency: 90 %).

Number of the contributing scenario 11

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Contributing exposure scenario controlling worker exposure for PROC 15

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 use

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

Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 90 % (dermal).

Exposure estimation and reference to its source

Environment

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

Fresh Water (Pelagic)	PEC: 0.063 mg/l; RCR: 0.924
Fresh Water (Sediment)	PEC: 0.835 mg/kg dw; RCR: 0.924
Marine Water (Pelagic)	PEC: 0.006 mg/l; RCR: 0.924
Marine Water (Sediment)	PEC: 0.083 mg/kg dw; RCR: 0.924
Agricultural Soil	PEC: 0.134 mg/kg dw; RCR: 0.95
Sewage Treatment Plant (Effluent)	PEC: 0.626 mg/l; RCR: 0.027

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].

Proc 1	EE(inhal): 0.066 ; EE(derm): 0.343
Proc 2	EE(inhal): 3.956 ; EE(derm): 0.274
Proc 3	EE(inhal): 3.956 ; EE(derm): 0.343
Proc 4	EE(inhal): 3.297 ; EE(derm): 0.686
Proc 5	EE(inhal): 3.297 ; EE(derm): 0.686
Proc 8a	EE(inhal): 1.319 ; EE(derm): 0.014
Proc 8b	EE(inhal): 1.978 ; EE(derm): 1.371
Proc 9	EE(inhal): 1.978 ; EE(derm): 1.371
Proc 14	EE(inhal): 1.978 ; EE(derm): 0.686
Proc 15	EE(inhal): 3.297 ; EE(derm): 0.034

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): 0.009 ; RCR(derm): 0.171
Proc 2	RCR(inhal): 0.565 ; RCR(derm): 0.137
Proc 3	RCR(inhal): 0.565 ; RCR(derm): 0.171
Proc 4	RCR(inhal): 0.471 ; RCR(derm): 0.343

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Proc 5	RCR(inhal): 0.471 ; RCR(derm): 0.343
Proc 8a	RCR(inhal): 0.188 ; RCR(derm): 0.007
Proc 8b	RCR(inhal): 0.283 ; RCR(derm): 0.686
Proc 9	RCR(inhal): 0.283 ; RCR(derm): 0.686
Proc 14	RCR(inhal): 0.283 ; RCR(derm): 0.343
Proc 15	RCR(inhal): 0.471 ; RCR(derm): 0.017

Number of the ES 3

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]

ERC1: Manufacture of substances

Product characteristics

Refer to attached safety data sheets

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

Contributing Scenarios

Number of the contributing scenario

1

Contributing exposure scenario controlling environmental exposure for ERC 1

Further specification

SpERC ESVOC 1.1b.v1 (ESVOC 3), release factors for (Sp)ERC were modified, assessment tool used: Chesar 1.1.3.

Amounts used

Daily amount per site: 66.67 to

Annual amount per site: 20000 to

Regional use tonnage (tonnes/year) 66.67

Environment factors not influenced by risk management

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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: 0.001 %

Release fraction to wastewater from process: 0.001 %

Release fraction to soil from process: 0.001%

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 (%): 87.5

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

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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

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

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 palm of 2 hands (480 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 4
Contributing exposure scenario controlling worker exposure for PROC 3

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 1 hour

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

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 15 minutes

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

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 6
Contributing exposure scenario controlling worker exposure for PROC 8a

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 1 hour

Human factors not influenced by risk management

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

Other given operational conditions affecting workers exposure

Indoor use

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

Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 99 % (dermal).

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 8b

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 palm of 2 hands (480 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. Wear respiratory protection (Efficiency: 90 %).

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

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PROC 9

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 palm of 2 hands (480 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. Wear respiratory protection (Efficiency: 90 %).

Number of the contributing scenario

9

Contributing exposure scenario controlling worker exposure for PROC 15

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 use

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

Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 90 % (dermal).

Exposure estimation and reference to its source

Environment

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

Fresh Water (Pelagic)	PEC: 0.004 mg/l; RCR: 0.64
Fresh Water (Sediment)	PEC: 0.058 mg/kg dw; RCR: 0.064
Marine Water (Pelagic)	PEC: 0.0004 mg/l; RCR: 0.064
Marine Water (Sediment)	PEC: 0.006 mg/kg dw; RCR: 0.064
Agricultural Soil	PEC: 0.009 mg/kg dw; RCR: 0.063
Sewage Treatment Plant (Effluent)	PEC: 0.042 mg/l; RCR: 0.002

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): 0.066 ; EE(derm): 0.343
Proc 2	EE(inhal): 3.956 ; EE(derm): 0.274
Proc 3	EE(inhal): 3.956 ; EE(derm): 0.343
Proc 4	EE(inhal): 3.297 ; EE(derm): 0.686
Proc 8a	EE(inhal): 1.319 ; EE(derm): 0.014

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Proc 8b	EE(inhal): 1.978 ; EE(derm): 1.371
Proc 9	EE(inhal): 1.978 ; EE(derm): 1.371
Proc 15	EE(inhal): 3.297 ; EE(derm): 0.034

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): 0.009 ; RCR(derm): 0.171
Proc 2	RCR(inhal): 0.565 ; RCR(derm): 0.137
Proc 3	RCR(inhal): 0.565 ; RCR(derm): 0.171
Proc 4	RCR(inhal): 0.471 ; RCR(derm): 0.343
Proc 8a	RCR(inhal): 0.188 ; RCR(derm): 0.007
Proc 8b	RCR(inhal): 0.283 ; RCR(derm): 0.686
Proc 9	RCR(inhal): 0.283 ; RCR(derm): 0.686
Proc 15	RCR(inhal): 0.471 ; RCR(derm): 0.017

Number of the ES 4

Short title of the exposure scenario

Functional Fluids

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)

Environmental release categories [ERC]

ERC7: Industrial use of substances in closed systems

Product characteristics

Refer to attached safety data sheets

Processes and activities covered by the exposure scenario

Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in industrial equipment including maintenance and related material transfers

Further explanations

Industrial use

Contributing Scenarios

Number of the contributing scenario

1

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Contributing exposure scenario controlling environmental exposure for ERC 7

Further specification

SpERC ESVOC 7.13a.v1 (ESVOC 31),
assessment tool used: Chesar 1.1.3.

Amounts used

Daily amount per site: 5 to
Annual amount per site: 100 to
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: 0.01 %
Release fraction to wastewater from process: 0.03 %
Release fraction to soil from process: 0.1%

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 (%): 87.5

Number of the contributing scenario 2

Contributing exposure scenario controlling worker exposure for PROC 1

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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

Number of the contributing scenario 3

Contributing exposure scenario controlling worker exposure for PROC 2

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 palm of 2 hands (480 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 4

Contributing exposure scenario controlling worker exposure for PROC 3

Further specification

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assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 1 hour

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

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

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

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

Liquid, vapour pressure < 0,5 kPa at STP

Frequency and duration of use

Avoid carrying out activities involving exposure for more than 15 minutes

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

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 6
Contributing exposure scenario controlling worker exposure for PROC 8a

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 1 hour

Human factors not influenced by risk management

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

Other given operational conditions affecting workers exposure

Indoor use

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

Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 99 % (dermal).

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 8b

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 kPa at STP

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

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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 palm of 2 hands (480 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. Wear respiratory protection (Efficiency: 90 %).

Number of the contributing scenario

8

Contributing exposure scenario controlling worker exposure for PROC 9

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 palm of 2 hands (480 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. Wear respiratory protection (Efficiency: 90 %).

Exposure estimation and reference to its source

Environment

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

Fresh Water (Pelagic)	PEC: 0.01 mg/l; RCR: 0.141
Fresh Water (Sediment)	PEC: 0.128 mg/kg dw; RCR: 0.142
Marine Water (Pelagic)	PEC: 0.001 mg/l; RCR: 0.141
Marine Water (Sediment)	PEC: 0.013 mg/kg dw; RCR: 0.14
Agricultural Soil	PEC: 0.021 mg/kg dw; RCR: 0.147
Sewage Treatment Plant (Effluent)	PEC: 0.094 mg/l; RCR: 0.004

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): 0.066 ; EE(derm): 0.343
Proc 2	EE(inhal): 3.956 ; EE(derm): 0.274
Proc 3	EE(inhal): 3.956 ; EE(derm): 0.343
Proc 4	EE(inhal): 3.297 ; EE(derm): 0.686
Proc 8a	EE(inhal): 1.319 ; EE(derm): 0.014
Proc 8b	EE(inhal): 1.978 ; EE(derm): 1.371
Proc 9	EE(inhal): 1.978 ; EE(derm): 1.371

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

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calculated values.

Proc 1	RCR(inhal): 0.009 ; RCR(derm): 0.171
Proc 2	RCR(inhal): 0.565 ; RCR(derm): 0.137
Proc 3	RCR(inhal): 0.565 ; RCR(derm): 0.171
Proc 4	RCR(inhal): 0.471 ; RCR(derm): 0.343
Proc 8a	RCR(inhal): 0.188 ; RCR(derm): 0.007
Proc 8b	RCR(inhal): 0.283 ; RCR(derm): 0.686
Proc 9	RCR(inhal): 0.283 ; RCR(derm): 0.686

Number of the ES 5

Short title of the exposure scenario

Functional Fluids

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)

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)

PROC20: Heat and pressure transfer fluids in dispersive, professional use but closed systems

Environmental release categories [ERC]

ERC9a: Wide dispersive indoor use of substances in closed systems

ERC9b: Wide dispersive outdoor use of substances in closed systems

Product characteristics

Refer to attached safety data sheets

Processes and activities covered by the exposure scenario

Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in industrial equipment including maintenance and related material transfers

Further explanations

Professional use

Contributing Scenarios

Number of the contributing scenario

1

Contributing exposure scenario controlling environmental exposure for ERC 9a ERC 9b

Further specification

SpERC ESVOC 9.13b.v1 (ESVOC 32),

assessment tool used: Chesar 1.1.3.

Amounts used

daily wide dispersive use: 0.00006 to/d

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Fraction of EU tonnage used in region: 0.1
Fraction of Regional tonnage used locally: 0.002
Amounts used (EU): 100 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

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

Release fraction to air from process: 5 %
Release fraction to wastewater from process: 2.5 %
Release fraction to soil from process: 2.5%

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 (%): 87.5

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

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Covers percentage substance in the product up to 100 % (unless stated differently)
Liquid, vapour pressure < 0,5 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

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

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 15 minutes

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

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

Wear suitable gloves tested to EN374.

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

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 1 hour

Human factors not influenced by risk management

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Area potentially exposed: corresponds to palm of 1 hand (240 cm²)
Other given operational conditions affecting workers exposure
Indoor and outdoor use

Number of the contributing scenario 5
Contributing exposure scenario controlling worker exposure for PROC 8a

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 1 hour

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

Number of the contributing scenario 6
Contributing exposure scenario controlling worker exposure for PROC 8b

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 palm of 2 hands (480 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

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

Wear respiratory protection (Efficiency: 90 %). 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 9

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 palm of 2 hands (480 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

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(Efficiency: 90 %).

Number of the contributing scenario 8
Contributing exposure scenario controlling worker exposure for PROC 20

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 palm of 2 hands (480 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

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

Wear respiratory protection (Efficiency: 90 %). 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: 0.00022 mg/l; RCR: 0.003
Fresh Water (Sediment)	PEC: 0.0003 mg/kg dw; RCR: 0.003
Marine Water (Pelagic)	PEC: 0.00003 mg/l; RCR: 0.003
Marine Water (Sediment)	PEC: 0.00027 mg/kg dw; RCR: 0.003
Agricultural Soil	PEC: 0.000038 mg/kg dw; RCR: 0.00027
Sewage Treatment Plant (Effluent)	PEC: 0.000086 mg/l; RCR: 0.000004

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): 0.066 ; EE(derm): 0.343
Proc 2	EE(inhal): 3.297 ; EE(derm): 0.274
Proc 3	EE(inhal): 3.956 ; EE(derm): 0.343
Proc 8a	EE(inhal): 3.297 ; EE(derm): 0.686
Proc 8b	EE(inhal): 3.956 ; EE(derm): 0.686
Proc 9	EE(inhal): 3.956 ; EE(derm): 0.686
Proc 20	EE(inhal): 1.978 ; EE(derm): 0.343

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): 0.009 ; RCR(derm): 0.171
Proc 2	RCR(inhal): 0.471 ; RCR(derm): 0.137
Proc 3	RCR(inhal): 0.565 ; RCR(derm): 0.171
Proc 8a	RCR(inhal): 0.471 ; RCR(derm): 0.343
Proc 8b	RCR(inhal): 0.565 ; RCR(derm): 0.343

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Proc 9
Proc 20

RCR(inhal): 0.565 ; RCR(derm): 0.343
RCR(inhal): 0.283 ; RCR(derm): 0.171

Number of the ES 6

Short title of the exposure scenario

lubricants

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)

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

PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

PROC10: Roller application or brushing

PROC13: Treatment of articles by dipping and pouring

PROC17: Lubrication at high energy conditions and in partly open process

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 of formulated lubricants in closed and open systems including transfer operations, operation of machinery/engines and similar articles, reworking on reject articles, equipment maintenance and disposal of wastes.

Further explanations

Industrial use

Contributing Scenarios

Number of the contributing scenario

1

Contributing exposure scenario controlling environmental exposure for ERC 4

Further specification

SpERC ESVOC 4.6a.v1 (ESVOC 13),
assessment tool used: Chesar 1.1.3.

Amounts used

Daily amount per site: 5 to

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Annual amount per site: 100 to
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: 0.003 %

Release fraction to wastewater from process: 0.03 %

Release fraction to soil from process: 0.1%

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 (%): 87.5

Number of the contributing scenario 2

Contributing exposure scenario controlling worker exposure for PROC 1

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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

Number of the contributing scenario 3

Contributing exposure scenario controlling worker exposure for PROC 2

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 palm of 2 hands (480 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 4

Contributing exposure scenario controlling worker exposure for PROC 3

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 1 hour

Human factors not influenced by risk management

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

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Other given operational conditions affecting workers exposure

Indoor and outdoor use

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

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 15 minutes

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

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.

Number of the contributing scenario 6
Contributing exposure scenario controlling worker exposure for PROC 7

Further specification

assessment tool used: StoffenManager RiskOfDerm

Product characteristics

Liquid, vapour pressure < 0,5 kPa at STP

Covers percentage substance in the product up to 20 %

Amounts used

0.5 L/min

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use

Room volume 100 - 1000 m³

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

Worker is segregated from source

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

Direction of application: Downward. air flow direction: away from worker. provide a good standard of general ventilation Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan. Distance from source: > 1 m².

Organisational measures to prevent /limit releases, dispersion and exposure

Clean equipment and the work area every day

Segregate the activity away from other operations

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

Inspect and clean equipment regularly. 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 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 kPa at STP

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

Frequency and duration of use

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Avoid carrying out activities involving exposure for more than 1 hour

Human factors not influenced by risk management

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

Other given operational conditions affecting workers exposure

Indoor use

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

Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 99 % (dermal).

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 8b

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 palm of 2 hands (480 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. Wear respiratory protection (Efficiency: 90 %).

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

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 palm of 2 hands (480 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. Wear respiratory protection (Efficiency: 90 %).

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

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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

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

Other given operational conditions affecting workers exposure

Indoor use

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

Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 95 % (dermal).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.

Number of the contributing scenario 11
Contributing exposure scenario controlling worker exposure for PROC 13

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 palm of 2 hands (480 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 specific activity training. Wear respiratory protection (Efficiency: 90 %).

Number of the contributing scenario 12
Contributing exposure scenario controlling worker exposure for PROC 17

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 2 hands (960 cm²)

Other given operational conditions affecting workers exposure

Indoor use

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

Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 95 % (inhalative); 95 % (dermal).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.

Exposure estimation and reference to its source

Environment

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

Fresh Water (Pelagic)	PEC: 0.01 mg/l; RCR: 0.141
Fresh Water (Sediment)	PEC: 0.128 mg/kg dw; RCR: 0.142
Marine Water (Pelagic)	PEC: 0.001 mg/l; RCR: 0.141
Marine Water (Sediment)	PEC: 0.013 mg/kg dw; RCR: 0.14
Agricultural Soil	PEC: 0.02 mg/kg dw; RCR: 0.142
Sewage Treatment Plant	PEC: 0.094 mg/l; RCR: 0.004

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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 1	EE(inhal): 0.066 ; EE(derm): 0.343
Proc 2	EE(inhal): 3.956 ; EE(derm): 0.274
Proc 3	EE(inhal): 3.956 ; EE(derm): 0.343
Proc 5	EE(inhal): 3.297 ; EE(derm): 0.686
Proc 7	EE(inhal): 0.64 ; EE(derm): 0.56
Proc 8a	EE(inhal): 1.319 ; EE(derm): 0.014
Proc 8b	EE(inhal): 1.978 ; EE(derm): 1.371
Proc 9	EE(inhal): 1.978 ; EE(derm): 1.371
Proc 10	EE(inhal): 2.374 ; EE(derm): 0.069
Proc 13	EE(inhal): 3.856 ; EE(derm): 0.686
Proc 17	EE(inhal): 3.956 ; EE(derm): 0.069

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): 0.009 ; RCR(derm): 0.171
Proc 2	RCR(inhal): 0.565 ; RCR(derm): 0.137
Proc 3	RCR(inhal): 0.565 ; RCR(derm): 0.171
Proc 5	RCR(inhal): 0.471 ; RCR(derm): 0.343
Proc 7	RCR(inhal): 0.09 ; RCR(derm): 0.27
Proc 8a	RCR(inhal): 0.188 ; RCR(derm): 0.007
Proc 8b	RCR(inhal): 0.283 ; RCR(derm): 0.686
Proc 9	RCR(inhal): 0.283 ; RCR(derm): 0.686
Proc 10	RCR(inhal): 0.339 ; RCR(derm): 0.034
Proc 13	RCR(inhal): 0.565 ; RCR(derm): 0.343
Proc 17	RCR(inhal): 0.565 ; RCR(derm): 0.034

Number of the ES 7

Short title of the exposure scenario

lubricants

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
PROC17: Lubrication at high energy conditions and in partly open process
PROC20: Heat and pressure transfer fluids in dispersive, professional use but closed systems

Environmental release categories [ERC]

ERC9a: Wide dispersive indoor use of substances in closed systems
ERC9b: Wide dispersive outdoor use of substances in closed systems

Product characteristics

Refer to attached safety data sheets

Processes and activities covered by the exposure scenario

Covers the use of formulated lubricants in closed and open systems including transfer operations, operation of engines and similar articles, reworking on reject articles, equipment maintenance and disposal of waste oil.

Further explanations

Professional use

Contributing Scenarios

Number of the contributing scenario	1
Contributing exposure scenario controlling environmental exposure for ERC 9a ERC 9b	

Further specification

SpERC ESVOC 9.6b.v1 (ESVOC 14),
assessment tool used: Chesar 1.1.3.

Amounts used

daily wide dispersive use: 0.00006 to/d
Fraction of EU tonnage used in region: 0.1
Fraction of Regional tonnage used locally: 0.002
Amounts used (EU): 100 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

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

Release fraction to air from process: 1 %
Release fraction to wastewater from process: 1 %
Release fraction to soil from process: 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 (%): 87.5

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

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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

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Indoor and outdoor use

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

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 15 minutes

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

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

Wear suitable gloves tested to EN374.

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

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 1 hour

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

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

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 1 hour

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 extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 90 % (dermal).

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

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PROC 8a

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 1 hour

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

Number of the contributing scenario

7

Contributing exposure scenario controlling worker exposure for PROC 8b

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 palm of 2 hands (480 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: 90 %).

Number of the contributing scenario

8

Contributing exposure scenario controlling worker exposure for PROC 10

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 kPa at STP

Covers percentage substance in the product up to 5 %

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

Number of the contributing scenario

9

Contributing exposure scenario controlling worker exposure for PROC 11

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Further specification

assessment tool used: StoffenManager RiskOfDerm

Product characteristics

Liquid, vapour pressure < 0,5 kPa at STP

Covers percentage substance in the product up to 20 %

Amounts used

500 mL/min

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use

Room volume 100 - 1000 m³

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

provide a good standard of general ventilation Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan. Distance from source: > 1 m². air flow direction: away from worker. Direction of application: Downward.

Organisational measures to prevent /limit releases, dispersion and exposure

Clean equipment and the work area every day

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

Inspect and clean equipment regularly. 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 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 palm of 2 hands (480 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 specific activity training. Wear respiratory protection (Efficiency: 90 %).

Number of the contributing scenario

11

Contributing exposure scenario controlling worker exposure for PROC 17

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 kPa at STP

Covers percentage substance in the product up to 5 %

Frequency and duration of use

Avoid carrying out activities involving exposure for more than 1 hour

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

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Number of the contributing scenario 12
Contributing exposure scenario controlling worker exposure for PROC 20

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 palm of 2 hands (480 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. Wear respiratory protection (Efficiency: 90 %).

Exposure estimation and reference to its source

Environment

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

Fresh Water (Pelagic)	PEC: 0.0002 mg/l; RCR: 0.003
Fresh Water (Sediment)	PEC: 0.003 mg/kg dw; RCR: 0.003
Marine Water (Pelagic)	PEC: 0.00002 mg/l; RCR: 0.003
Marine Water (Sediment)	PEC: 0.0003 mg/kg dw; RCR: 0.003
Agricultural Soil	PEC: 0.00003 mg/kg dw; RCR: 0.0002
Sewage Treatment Plant (Effluent)	PEC: 0.00003 mg/l; RCR: 0.000001

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): 0.066 ; EE(derm): 0.343
Proc 2	EE(inhal): 3.297 ; EE(derm): 0.274
Proc 3	EE(inhal): 3.956 ; EE(derm): 0.343
Proc 4	EE(inhal): 2.637 ; EE(derm): 0.137
Proc 8a	EE(inhal): 3.297 ; EE(derm): 0.686
Proc 8b	EE(inhal): 3.956 ; EE(derm): 0.686
Proc 10	EE(inhal): 1.978 ; EE(derm): 1.371
Proc 11	EE(inhal): 0.64 ; EE(derm): 0.56
Proc 13	EE(inhal): 3.956 ; EE(derm): 0.686
Proc 17	EE(inhal): 1.319 ; EE(derm): 1.371
Proc 20	EE(inhal): 1.978 ; EE(derm): 0.343

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): 0.009 ; RCR(derm): 0.171
Proc 2	RCR(inhal): 0.471 ; RCR(derm): 0.137
Proc 3	RCR(inhal): 0.565 ; RCR(derm): 0.171

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Proc 4	RCR(inhal): 0.377 ; RCR(derm): 0.069
Proc 8a	RCR(inhal): 0.471 ; RCR(derm): 0.343
Proc 8b	RCR(inhal): 0.565 ; RCR(derm): 0.343
Proc 10	RCR(inhal): 0.283 ; RCR(derm): 0.686
Proc 11	RCR(inhal): 0.09 ; RCR(derm): 0.28
Proc 13	RCR(inhal): 0.565 ; RCR(derm): 0.343
Proc 17	RCR(inhal): 0.188 ; RCR(derm): 0.686
Proc 20	RCR(inhal): 0.283 ; RCR(derm): 0.171

Number of the ES 8

Short title of the exposure scenario

Metal working fluids / rolling oils

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)

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

PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

PROC10: Roller application or brushing

PROC13: Treatment of articles by dipping and pouring

PROC17: Lubrication at high energy conditions and in partly open process

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 formulated MWFs (MWFs)/rolling oils including transfer operations, rolling and annealing activities, cutting/machining activities, automated and manual application of corrosion protections (including brushing, dipping and spraying), equipment maintenance, draining and disposal of waste oils.

Further explanations

Industrial use

Contributing Scenarios

Number of the contributing scenario

1

**Contributing exposure scenario controlling environmental exposure for
ERC 4**

Further specification

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SpERC ESVOC 4.7a.v1 (ESVOC 18),
assessment tool used: Chesar 1.1.3.

Amounts used

Daily amount per site: 5 to
Annual amount per site: 100 to
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: 0.6 %
Release fraction to wastewater from process: 0.03 %
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 (%): 87.5

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

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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

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

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 palm of 2 hands (480 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 4
Contributing exposure scenario controlling worker exposure for PROC 3

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

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Liquid, vapour pressure < 0,5 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 1 hour

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

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

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 15 minutes

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

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.

Number of the contributing scenario 6
Contributing exposure scenario controlling worker exposure for PROC 7

Further specification

assessment tool used: StoffenManager RiskOfDerm

Product characteristics

Liquid, vapour pressure < 0,5 kPa at STP
Covers percentage substance in the product up to 20 %

Amounts used

Use rate: 500 mL/min

Frequency and duration of use

Avoid carrying out activities involving exposure for more than 1 hour

Other given operational conditions affecting workers exposure

Indoor use

Room volume 100 - 1000 m³

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

Worker is segregated from source

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

Distance from source: < 1 m². Direction of application: Downward. air flow direction: away from worker. provide a good standard of general ventilation Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan.

Organisational measures to prevent /limit releases, dispersion and exposure

Clean equipment and the work area every day

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

Inspect and clean equipment regularly. 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

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Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 1 hour

Human factors not influenced by risk management

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

Other given operational conditions affecting workers exposure

Indoor use

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

Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 99 % (dermal).

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 8b

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 palm of 2 hands (480 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. Wear respiratory protection (Efficiency: 90 %).

Number of the contributing scenario

9

Contributing exposure scenario controlling worker exposure for PROC 9

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 palm of 2 hands (480 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. Wear respiratory protection (Efficiency: 90 %).

Number of the contributing scenario

10

Contributing exposure scenario controlling worker exposure for PROC 10

Further specification

assessment tool used: Chesar 1.1.3

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Product characteristics

Liquid, vapour pressure < 0,5 kPa at STP
Covers percentage substance in the product up to 25 %

Frequency and duration of use

4 h (half 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 use

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

Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 95 % (dermal).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.

Number of the contributing scenario

11

Contributing exposure scenario controlling worker exposure for PROC 13

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 palm of 2 hands (480 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 specific activity training. Wear respiratory protection (Efficiency: 90 %).

Number of the contributing scenario

12

Contributing exposure scenario controlling worker exposure for PROC 17

Further specification

assessment tool used: StoffenManager RiskOfDerm

Product characteristics

Liquid, vapour pressure < 0,5 kPa at STP
Covers percentage substance in the product up to 20 %

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 use

Room volume 100 - 1000 m³

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

Containment of source

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

Distance from source: > 1 m². Worker in separate cabine without specific ventilation. Segregate the activity away from other operations. provide a good standard of general ventilation Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan.

Organisational measures to prevent /limit releases, dispersion and exposure

Clean equipment and the work area every day

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

Wear suitable gloves tested to EN374. Inspect and clean equipment regularly.

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Exposure estimation and reference to its source

Environment

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

Fresh Water (Pelagic)	PEC: 0.01 mg/l; RCR: 0.141
Fresh Water (Sediment)	PEC: 0.128 mg/kg dw; RCR: 0.142
Marine Water (Pelagic)	PEC: 0.001 mg/l; RCR: 0.141
Marine Water (Sediment)	PEC: 0.013 mg/kg dw; RCR: 0.142
Agricultural Soil	PEC: 0.02 mg/kg dw; RCR: 0.143
Sewage Treatment Plant (Effluent)	PEC: 0.094 mg/l; RCR: 0.004

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): 0.066 ; EE(derm): 0.343
Proc 2	EE(inhal): 3.956 ; EE(derm): 0.274
Proc 3	EE(inhal): 3.956 ; EE(derm): 0.343
Proc 5	EE(inhal): 3.297 ; EE(derm): 0.686
Proc 7	EE(inhal): 0.64 ; EE(derm): 0.65
Proc 8a	EE(inhal): 1.319 ; EE(derm): 0.014
Proc 8b	EE(inhal): 1.978 ; EE(derm): 1.371
Proc 9	EE(inhal): 1.978 ; EE(derm): 1.371
Proc 10	EE(inhal): 2.374 ; EE(derm): 0.069
Proc 13	EE(inhal): 3.856 ; EE(derm): 0.686
Proc 17	EE(inhal): 0.029 ; EE(derm): 0.467

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): 0.009 ; RCR(derm): 0.171
Proc 2	RCR(inhal): 0.565 ; RCR(derm): 0.137
Proc 3	RCR(inhal): 0.565 ; RCR(derm): 0.171
Proc 5	RCR(inhal): 0.471 ; RCR(derm): 0.343
Proc 7	RCR(inhal): 0.09 ; RCR(derm): 0.32
Proc 8a	RCR(inhal): 0.188 ; RCR(derm): 0.007
Proc 8b	RCR(inhal): 0.283 ; RCR(derm): 0.686
Proc 9	RCR(inhal): 0.283 ; RCR(derm): 0.686
Proc 10	RCR(inhal): 0.339 ; RCR(derm): 0.034
Proc 13	RCR(inhal): 0.565 ; RCR(derm): 0.343
Proc 17	RCR(inhal): 0.004 ; RCR(derm): 0.234

Number of the ES 9

Short title of the exposure scenario

Metal working fluids / rolling oils

List of use descriptors

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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)

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

PROC17: Lubrication at high energy conditions and in partly open process

Environmental release categories [ERC]

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

ERC8d: Wide dispersive outdoor 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 formulated MWFs (MWFs) including transfer operations, open and contained cutting/machining activities, automated and manual application of corrosion protections, draining and working on contaminated/ reject articles, and disposal of waste oils.

Further explanations

Professional use

Contributing Scenarios

Number of the contributing scenario

1

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

Further specification

SpERC ESVOC 8.7c.v1 (ESVOC 20),
assessment tool used: Chesar 1.1.3.

Amounts used

daily wide dispersive use: 0.00005 to/d

Fraction of Regional tonnage used locally: 0.1

Fraction of EU tonnage used in region: 0.002

Amounts used (EU): 100 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

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

Release fraction to air from process: 0.5 %

Release fraction to wastewater from process: 5 %

Release fraction to soil from process: 5%

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 (%): 87.5

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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 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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

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

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 15 minutes

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

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

Wear suitable gloves tested to EN374.

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

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 1 hour

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

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

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 kPa at STP

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

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Frequency and duration of use

Avoid carrying out activities involving exposure for more than 1 hour

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 extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 99.5 % (dermal).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.

Number of the contributing scenario

6

Contributing exposure scenario controlling worker exposure for PROC 8a

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 1 hour

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

Number of the contributing scenario

7

Contributing exposure scenario controlling worker exposure for PROC 8b

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 palm of 2 hands (480 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: 90 %).

Number of the contributing scenario

8

Contributing exposure scenario controlling worker exposure for PROC 10

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 kPa at STP

Covers percentage substance in the product up to 5 %

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Frequency and duration of use

4 h (half 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

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

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

Number of the contributing scenario

9

Contributing exposure scenario controlling worker exposure for PROC 11

Further specification

assessment tool used: StoffenManager RiskOfDerm

Product characteristics

Liquid, vapour pressure < 0,5 kPa at STP

Covers percentage substance in the product up to 20 %

Amounts used

Use rate: 500 mL/min

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use

Room volume 100 - 1000 m³

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

Worker is segregated from source

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

provide a good standard of general ventilation Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan. Distance from source: > 1 m². Segregate the activity away from other operations.

Direction of application: Downward. air flow direction: away from worker.

Organisational measures to prevent /limit releases, dispersion and exposure

Clean equipment and the work area every day

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

Inspect and clean equipment regularly. 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 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 palm of 2 hands (480 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 specific activity training. Wear respiratory protection (Efficiency: 90 %).

Number of the contributing scenario

11

Contributing exposure scenario controlling worker exposure for PROC 17

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Further specification

assessment tool used: StoffenManager RiskOfDerm

Product characteristics

Liquid, vapour pressure < 0,5 kPa at STP

Covers percentage substance in the product up to 20 %

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use

Room volume 100 - 1000 m³

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

Containment of source

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

provide a good standard of general ventilation Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan. Worker in separate cabine without specific ventilation.

Organisational measures to prevent /limit releases, dispersion and exposure

Clean equipment and the work area every day

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

Inspect and clean equipment regularly. 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: 0.0002 mg/l; RCR: 0.003
Fresh Water (Sediment)	PEC: 0.003 mg/kg dw; RCR: 0.003
Marine Water (Pelagic)	PEC: 0.00002 mg/l; RCR: 0.003
Marine Water (Sediment)	PEC: 0.0003 mg/kg dw; RCR: 0.003
Agricultural Soil	PEC: 0.00006 mg/kg dw; RCR: 0.0004
Sewage Treatment Plant (Effluent)	PEC: 0.00017 mg/l; RCR: 0.00007

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): 0.066 ; EE(derm): 0.343
Proc 2	EE(inhal): 3.297 ; EE(derm): 0.274
Proc 3	EE(inhal): 3.956 ; EE(derm): 0.343
Proc 5	EE(inhal): 2.637 ; EE(derm): 0.003
Proc 8a	EE(inhal): 3.297 ; EE(derm): 0.686
Proc 8b	EE(inhal): 3.956 ; EE(derm): 0.686
Proc 10	EE(inhal): 1.978 ; EE(derm): 1.371
Proc 11	EE(inhal): 0.64 ; EE(derm): 0.56
Proc 13	EE(inhal): 3.956 ; EE(derm): 0.686
Proc 17	EE(inhal): 0.029 ; EE(derm): 0.467

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): 0.009 ; RCR(derm): 0.171
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Proc 2	RCR(inhal): 0.471 ; RCR(derm): 0.137
Proc 3	RCR(inhal): 0.565 ; RCR(derm): 0.171
Proc 5	RCR(inhal): 0.377 ; RCR(derm): 0.002
Proc 8a	RCR(inhal): 0.471 ; RCR(derm): 0.343
Proc 8b	RCR(inhal): 0.565 ; RCR(derm): 0.343
Proc 10	RCR(inhal): 0.283 ; RCR(derm): 0.686
Proc 11	RCR(inhal): 0.09 ; RCR(derm): 0.27
Proc 13	RCR(inhal): 0.565 ; RCR(derm): 0.343
Proc 17	RCR(inhal): 0.004 ; RCR(derm): 0.234

Number of the ES 10

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

Contributing Scenarios

Number of the contributing scenario

1

Contributing exposure scenario controlling environmental exposure for ERC 4

Further specification

assessment tool used: Chesar 1.1.3.

Amounts used

Daily amount per site: 0.005 to

Annual amount per site: 0.1 to

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

Other given operational conditions affecting environmental exposure

Indoor use

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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: 2 %
Release fraction to soil from process: 0.01%

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 (%): 87.5

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

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 2 hands (960 cm²)

Other given operational conditions affecting workers exposure

Indoor use

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

Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 95 % (dermal).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.

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

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 use

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

Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 90 % (dermal).

Exposure estimation and reference to its source

Environment

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

Fresh Water (Pelagic)	PEC: 0.0008 mg/l; RCR: 0.012
Fresh Water (Sediment)	PEC: 0.011 mg/kg dw; RCR: 0.012
Marine Water (Pelagic)	PEC: 0.00008 mg/l; RCR: 0.012
Marine Water (Sediment)	PEC: 0.001 mg/kg dw; RCR: 0.012
Agricultural Soil	PEC: 0.001 mg/kg dw; RCR: 0.01
Sewage Treatment Plant	PEC: 0.006 mg/l; RCR: 0.00027

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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]. The RMMs described above suffice to control risks for both local and systemic effects. Exposure estimates are given for either short-term or long-term exposure depending on which lead to more conservative risk characterisation ratios.

Proc 10	EE(inhal): 2.374 ; EE(derm): 0.069
Proc 15	EE(inhal): 3.297 ; EE(derm): 0.034

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): 0.339 ; RCR(derm): 0.034
Proc 15	RCR(inhal): 0.471 ; RCR(derm): 0.017

Number of the ES 11

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

Contributing Scenarios

Number of the contributing scenario

1

Contributing exposure scenario controlling environmental exposure for ERC 8a

Further specification

SpERC ESVOC 8.17.v1 (ESVOC 39),

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assessment tool used: Chesar 1.1.3.

Amounts used

daily wide dispersive use: 0.000006 to/d
Fraction of Regional tonnage used locally: 0.002
Fraction of EU tonnage used in region: 0.1
Amounts used (EU): 10 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 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 (%): 87.5

Number of the contributing scenario

2

Contributing exposure scenario controlling worker exposure for PROC 10

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 kPa at STP
Covers percentage substance in the product up to 5 %

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

Number of the contributing scenario

3

Contributing exposure scenario controlling worker exposure for PROC 15

Further specification

assessment tool used: Chesar 1.1.3

Product characteristics

Liquid, vapour pressure < 0,5 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 palm of 1 hand (240 cm²)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

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

Wear respiratory protection (Efficiency: 90 %).

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: 0.0002 mg/l; RCR: 0.003
Fresh Water (Sediment)	PEC: 0.003 mg/kg dw; RCR: 0.003
Marine Water (Pelagic)	PEC: 0.00002 mg/l; RCR: 0.003
Marine Water (Sediment)	PEC: 0.0003 mg/kg dw; RCR: 0.003
Agricultural Soil	PEC: 0.0006 mg/kg dw; RCR: 0.0004
Sewage Treatment Plant (Effluent)	PEC: 0.0002 mg/l; RCR: 0.000008

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): 1.978 ; EE(derm): 1.371
Proc 15	EE(inhal): 1.978 ; EE(derm): 0.343

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): 0.283 ; RCR(derm): 0.686
Proc 15	RCR(inhal): 0.283 ; RCR(derm): 0.171