

SAFETY DATA SHEET (EC 1907/2006)**VESTASOL® IP**

Version: **14.1 / GB**
Revision date: **03.04.2017**
Issue date: 11.10.2001
replaces version: 14.0
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Material no.
Specification **116097**
VA-Nr

**SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1. Product identifier**

Trade name VESTASOL® IP
Chemical Name (3,5,5-TRIMETHYLCYCLOHEX-2-ENONE)
CAS-No. 78-59-1
REACH Registration No.: 01-21 19497282-32-0000
EC-No. 201-126-0

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

Relevant applications identified Solvents for binding agents, resins and other chemical products
High-boiling solvents in the paint and ink industry
Solvents for crop protectants
Raw material for further chemical syntheses

1.3. Details of the supplier of the safety data sheet

Company Evonik Resource Efficiency GmbH
RE-ES-PS Marl
D-45764 Marl
Telephone +49 (0)2365 49-9282
Telefax +49 (0)2365 49-7275
E-mail address MSDSInfo-COHP@evonik.com

1.4. Emergency telephone number

Emergency information +49 (0)2365 49-2232 (Interpreting service available)
Emergency information +49 (0)2365 49-4423 (Telefax)

SECTION 2: Hazards identification**2.1. Classification of the substance or mixture****Classification according to Regulation (EC) No. 1272/2008 [CLP]**

REGULATION (EC) No 1272/2008

Acute toxicity (Oral)	Category 4	H302
Acute toxicity (Dermal)	Category 4	H312
Eye irritation	Category 2	H319
Carcinogenicity	Category 2	H351
Specific target organ toxicity - single exposure (Respiratory system)	Category 3	H335

2.2. Label elements**Labelling as per (EU) 1272/2008**

Statutory basis REGULATION (EC) No 1272/2008

hazard-defining component(s) (GHS)

- isophorone

Symbol(s)



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Signal word	Warning
Hazard statement	H302 + H312 - Harmful if swallowed or in contact with skin H319 - Causes serious eye irritation. H335 - May cause respiratory irritation. H351 - Suspected of causing cancer.
Precautionary statement Prevention	P201 - Obtain special instructions before use. P261 - Avoid breathing dust/ fume/ gas/ mist/ vapours/spray. P262 - Do not get in eyes, on skin, or on clothing. P264 - Wash skin thoroughly after handling. P280 - Wear protective gloves/ protective clothing/ eye protection/ face protection.
Precautionary statement Reaction	P308 + P313 - IF exposed or concerned: Get medical advice/ attention.

2.3. Other hazards

Not a PBT, vPvB substance according to the criteria of the REACH Regulation.

SECTION 3: Composition/information on ingredients**3.1. Substances**

Information on ingredients / Hazardous components as per EU-CLP Regulation (EC) No. 1272/2008

• isophorone		>= 98%			
CAS-No.	78-59-1	EC-No.	201-126-0	REACH-No.	01-2119497282-32
Acute toxicity (Oral)				Category 4	H302
Acute toxicity (Dermal)				Category 4	H312
Eye irritation				Category 2	H319
Carcinogenicity				Category 2	H351
Specific target organ toxicity - single exposure (Respiratory system)				Category 3	H335
• 3,5,5-trimethylcyclohex-3-en-1-one		<= 1.5%			
CAS-No.	471-01-2	EC-No.	207-434-1	REACH-No.	05-2114273116-53
Eye irritation				Category 2	H319

Texts of H phrases, see in Chapter 16

3.2. Mixtures

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SECTION 4: First aid measures**4.1. Description of first aid measures**

Pay attention to self-protection.
 Move out of dangerous area.
 Keep warm, position comfortably, and cover well.
 Do not leave affected persons unattended.

Inhalation

Seek medical advice immediately.
 Employ artificial respiration if breathing ceases.

Skin contact

Wash off affected area immediately with plenty of water.
 Continue decontamination with polyethylene glycol 400 after initial rinsing with water and then wash with water and soap.

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If symptoms persist, consult a physician for treatment.

Eye contact

With eye held open, thoroughly rinse immediately with plenty of water for at least 10 minutes. Consult an ophthalmologist immediately if the symptoms persist.

Ingestion

Rinse mouth.
Immediately give large quantities of water to drink.
Obtain medical attention.

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

Symptoms

Eye irritation
May cause irritations of the respiratory tract.

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

After accidental absorption in the body, the pathology and clinical findings are dependent on the kinetics of the noxious substance (quantity of absorbed substance, the absorption time, and the effectiveness of early elimination measures (first aid)/ excretion - metabolism).

Continue with first aid measures.

Depending on the pathology and clinical findings, patient monitoring and symptomatic treatment are necessary.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media: water spray
foam
CO₂
dry powder

5.2. Special hazards arising from the substance or mixture

May be released in case of fire: carbon monoxide, carbon dioxide, organic products of decomposition. Under certain fire conditions, traces of other toxic products may occur.
Cool closed containers exposed to fire with water spray.
Closed container may rupture if strongly heated.

5.3. Advice for firefighters

In case of fire: wear a self contained respiratory apparatus

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Do not inhale vapours / aerosols.
Avoid contact with skin and eyes.

6.2. Environmental precautions

Do not flush into surface water or sanitary sewer system.

6.3. Methods and material for containment and cleaning up

Take up mechanically or with an absorbent material.
Fill into marked, sealable containers.

Suitable binder: sand, diatomaceous earth, universal absorbent

6.4. Reference to other sections

Wear personal protective equipment; see section 8.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

If possible, use material transfer/filling, metering and blending plants that are closed.

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Avoid contact with skin and eyes. Assumes a good basic standard of occupational hygiene is implemented. Consider technical advances and process upgrades (including automation) for the elimination of releases. minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of waste safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.

Training for staff on good practice.

Control staff entry to working area.

Ensure all equipment well maintained.

Regular cleaning of equipment and work area.

Recording of any 'near miss' situations.

7.2. Conditions for safe storage, including any incompatibilities

Advice on protection against fire and explosion

General rules of fire prevention should be observed.

Storage

Keep container tightly closed.

Keep in a well-ventilated place.

Advice on common storage

Observe prohibition against storing together!

German storage class

10 - Combustible liquids

Storage stability

Stable under recommended storage conditions.

7.3. Specific end use(s)

We are unaware of any specific end uses which go beyond the data reported in Section 1.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

• isophorone			
CAS-No.	78-59-1	EC-No.	201-126-0
Control parameters	5 ppm 29 mg/m ³		Short Term Exposure Limit (STEL):(EH40 WEL)

DNEL/DMEL values

End Use	Workers
Routes of exposure	Inhalation
Possible health damage	Long-term - systemic effects
Value	11 mg/m ³
End Use	Workers
Routes of exposure	Inhalation
Possible health damage	Acute - systemic effects
Value	22 mg/m ³
End Use	Workers
Routes of exposure	Inhalation
Possible health damage	Long-term - local effects
Value	11 mg/m ³
End Use	Workers
Routes of exposure	Inhalation

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Possible health damage Value	Acute - local effects 22 mg/m ³
End Use	Workers
Routes of exposure	dermal
Possible health damage Value	Long-term - systemic effects 20.5 mg/kg
End Use	Workers
Routes of exposure	dermal
Possible health damage Value	Acute - systemic effects 41 mg/kg
End Use	Workers
Routes of exposure	dermal
Possible health damage	Long-term - local effects
Remarks	No hazard identified.
End Use	Workers
Routes of exposure	dermal
Possible health damage	Acute - local effects
Remarks	No hazard identified.
End Use	Workers
Routes of exposure	eye
Possible health damage	Local effects
Remarks	Low hazard (no threshold derived).

PNEC values

Value	Fresh water 0.089 mg/l
Value	Fresh water sediment 0.839 mg/kg (dry weight)
Value	Intermittent use/release 1.2 mg/l
Value	Marine water 0.0089 mg/l
Value	Marine sediment 0.0839 mg/kg (dry weight)
Value	Sewage treatment plant 1 mg/l
Value	Soil 0.12 mg/kg (dry weight)
Remarks	Air No hazard identified.
Value	oral (secondary poisoning) 20 mg/kg dietary

8.2. Exposure controls**Engineering measures**

see section 7.

Personal protective equipment**Respiratory protection**

In case of unavoidable exposed handling or if larger amounts are released (leakage, spillage):

use respiratory equipment with suitable filter

Filter type A-P

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**Hand protection**

Chemical-resistant protective gloves (EN 374)

Glove material butyl-rubber

Material thickness > 0.5 mm

Break through time > 480 min

Method DIN EN 374

Eye protection

close-fitting protective goggles (e.g. closed goggles)

Hygiene measures

Avoid contact with skin and eyes.

Wash face and/or hands before break and end of work.

Remove contaminated or saturated clothing immediately and dispose of safely.

Do not inhale vapours / aerosols.

Use disposable clothing if appropriate.

Keep working clothes separately.

Smoking, eating and drinking should be prohibited in the application area.

SECTION 9: Physical and chemical properties**9.1. Information on basic physical and chemical properties**

Appearance

Form liquid

Colour clear

physical state liquid

Odour of peppermint

Odour threshold: No data available
Not required by safety or application considerations.

pH neutral

Melting point/range -8.1 °C (ca. 1013 hPa)

Boiling point/range 215.3 °C (1013 hPa)

Flash point 85 °C
Method: closed cupEvaporation rate No data available
Not required by safety or application considerations.Flammability (solid, gas) not applicable
liquid

Lower explosion limit 0.8 %(V)

Upper explosion limit 3.8 %(V)

Vapour pressure 0.4 hPa (20 °C)

Vapour density No data available
Not required by safety or application considerations.

Relative density 0.92 (20 °C) (1013 hPa)

Water solubility 14.5 g/l (20 °C)

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Partition coefficient n-octanol/water	log Pow: 1.67 (measured)
Autoinflammability	The substance or mixture is not classified as pyrophoric. The substance or mixture is not classified as self heating.
Thermal decomposition	Distills without decomposition at atmospheric pressure.
Viscosity, dynamic	2.6 mPa.s (20 °C)
Viscosity, kinematic	2.83 mm ² /s (20 °C) Method: OECD Test Guideline 114
Explosiveness	Not explosive
Oxidizing properties	The substance or mixture is not classified as oxidizing.

9.2. Other information

formation of flammable gases	The substance or mixture does not emit flammable gases in contact with water.
Ignition temperature	470 °C (1013 hPa)
peroxides	The substance or mixture is not classified as organic peroxide.
Metal corrosion	Not corrosive to metals

SECTION 10: Stability and reactivity**10.1. Reactivity**

Stable under recommended storage conditions.

10.2. Chemical stability

Under normal conditions: stable.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions No decomposition if used as directed.

10.4. Conditions to avoid

Keep away from heat and sources of ignition.

10.5. Incompatible materials

None known.

10.6. Hazardous decomposition productsDecomposition products on thermal decomposition
Carbon monoxide
carbon dioxide

SECTION 11: Toxicological information**11.1. Information on toxicological effects**

Acute oral toxicity	LD50 Rat: 1500 mg/kg Method: analogy OECD
Acute inhalation toxicity	LC50 Rat: 7 mg/l / 4 h / dust/mist Method: analogy OECD Based on available data, the classification criteria are not met.

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Acute dermal toxicity	LD50 Rabbit: 1200 mg/kg Method: analogy OECD
Skin irritation	Rabbit / 4 h No skin irritation Method: OECD Test Guideline 404 Based on available data, the classification criteria are not met.
Eye irritation	Rabbit / 24 h Irritating to eyes. Method: Draize Test
Sensitization	(Magnusson-Kligman test) Guinea pig: Did not cause sensitisation on laboratory animals. Method: OECD Test Guideline 406 Based on available data, the classification criteria are not met. sensitizing to the respiratory tract: No data available
Assessment of STOT single exposure	Assessment The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation.
Assessment of STOT repeat exposure	Assessment The substance or mixture is not classified as specific target organ toxicant, repeated exposure.
Risk of aspiration toxicity	No aspiration toxicity classification Based on available data, the classification criteria are not met.
CMR assessment	
Carcinogenicity	Limited evidence of a carcinogenic effect.
Mutagenicity	Tests on bacterial or mammalian cell cultures did not show mutagenic effects. Animal testing did not show any mutagenic effects.
Teratogenicity	no evidence of teratogenic properties
Toxicity to reproduction	No toxicity to reproduction

SECTION 12: Ecological information**12.1. Toxicity**

Toxicity to fish	LC50 Pimephales promelas (fathead minnow): 228 mg/l / 96 h
Toxicity in aquatic invertebrates	EC50 Daphnia magna: 120 mg/l / 48 h
Toxicity to algae	EbC50 Desmodesmus subspicatus (green algae): 475 mg/l / 72 h Method: procedure proposed by the UBA 2/84 (Federal German Environmental Agency)
Toxicity to bacteria	EC50 Pseudomonas putida: 100 mg/l / 3 h
chronic toxicity in fish	NOEC Pimephales promelas: 11 mg/l / 35 d

12.2. Persistence and degradability

Biodegradability	inoculum: Activated sludge
	Exposure time: 28 d
	Result: 95 % Readily biodegradable.

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Method: Directive 92/69/EEC C.4-A

12.3. Bioaccumulative potential

Bioaccumulation

Species: Lepomis macrochirus

Bioconcentration factor (BCF): 7

Method: flow-through test

12.4. Mobility in soil

Mobility

The soil mobility of the substance is only minimally affected by adsorption to soil components.

The substance will occur mainly in bodies of water due to its environmental distribution characteristics.

The effects of light decompose the substance rapidly in the atmosphere.

12.5. Results of PBT and vPvB assessment

Not a PBT, vPvB substance according to the criteria of the REACH Regulation.

12.6. Other adverse effects

Further Information

No further information available

SECTION 13: Disposal considerations**13.1. Waste treatment methods****Product**

With respect to local regulations, e.g. dispose of to suitable waste incineration plant.

No waste key number as per the European Waste Types List can be assigned to this product, since such classification is based on the (as yet undetermined) use to which the product is put by the consumer.

The waste key number must be determined as per the European Waste Types List (decision on EU Waste Types List 2000/532/EC) in cooperation with the disposal firm / producing firm / official authority.

SECTION 14: Transport information**Transport on land (ADR/RID/GGVSEB)**

Not dangerous according to transport regulations.

- 14.1. UN number: --
14.2. UN proper shipping name: --
14.3. Transport hazard class(es): --
14.4. Packing group: --
14.5. Environmental hazards: --
14.6. Special precautions for user: Yes

ADR: Not classified as dangerous for conveyance in the meaning of the Carriage of Dangerous Goods by Road and Rail (ADR / RID).

RID: Not classified as dangerous for conveyance in the meaning of the Carriage of Dangerous Goods by Road and Rail (ADR / RID).

Inland waterway transport (ADN/GGVSEB (Germany))

- 14.1. UN number: UN 9003
14.2. UN proper shipping name: STOFFE MIT EINEM FLAMMPUNKT ÜBER 60°C UND HÖCHSTENS 100 °C

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- 14.3. Transport hazard class(es): 9
 14.4. Packing group: --
 14.5. Environmental hazards: --
 14.6. Special precautions for user: No

Air transport ICAO-TI/IATA-DGR**Not dangerous according to transport regulations.**

- 14.1. UN number: --
 14.2. UN proper shipping name: --
 14.3. Transport hazard class(es): --
 14.4. Packing group: --
 14.5. Environmental hazards: --
 14.6. Special precautions for user: Yes
 IATA-C: Not hazardous freight in air traffic (ICAO-TI / IATA-DGR).
 IATA-P: Not hazardous freight in air traffic (ICAO-TI / IATA-DGR).

Sea transport IMDG-Code/GGVSee (Germany)**Not dangerous according to transport regulations.**

- 14.1. UN number: --
 14.2. UN proper shipping name: --
 14.3. Transport hazard class(es): --
 14.4. Packing group: --
 14.5. Environmental hazards: --
 14.6. Special precautions for user: Yes
 Not classified as hazardous sea cargo (IMDG code)
 For USA only; packaging size more than 450 l: COMBUSTIBLE LIQUID, N.O.S. (Isophorone), NA 1993, III, flash point 85°C
- 14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: for transport approval see regulatory information

SECTION 15: Regulatory information**15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture****National legislation**

Major Accident Hazard Legislation Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.
 listing: not applicable

registration

USA (TSCA)	listed/registered
Canada (DSL)	listed/registered
Australia (AICS)	listed/registered
Japan (MITI)	listed/registered
Korea (KECI)	listed/registered
Philippines (PICCS)	listed/registered
China	listed/registered
New Zealand	listed/registered
Taiwan	listed/registered

Information on additional inventories on request.

15.2. Chemical safety assessment

Chemical safety assessment A substance safety assessment was carried out for this product.

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**SECTION 16: Other information****Relevant H phrases from chapter 3**

H302 : Harmful if swallowed.
H312 : Harmful in contact with skin.
H319 : Causes serious eye irritation.
H335 : May cause respiratory irritation.
H351 : Suspected of causing cancer.

Further information

Changes since the last version are highlighted in the margin. This version replaces all previous versions.

This information and all further technical advice is based on our present knowledge and experience. However, it implies no liability or other legal responsibility on our part, including with regard to existing third party intellectual property rights, especially patent rights. In particular, no warranty, whether express or implied, or guarantee of product properties in the legal sense is intended or implied. We reserve the right to make any changes according to technological progress or further developments. The customer is not released from the obligation to conduct careful inspection and testing of incoming goods. Performance of the product described herein should be verified by testing, which should be carried out only by qualified experts in the sole responsibility of a customer. Reference to trade names used by other companies is neither a recommendation, nor does it imply that similar products could not be used.

Legend

ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
ADN	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
ASTM	American Society for Testing and Materials
ATP	Adaptation to Technical Progress
BCF	Bioconcentration factor
BetrSichV	German Ordinance on Industrial Safety and Health
c.c.	closed cup
CAS	Chemical Abstract Services
CESIO	European Committee of Organic Surfactants and their Intermediates
ChemG	German Chemicals Act
CMR	carcinogenic-mutagenic-toxic for reproduction
DIN	German Institute for Standardization
DMEL	Derived minimum effect level
DNEL	Derived no effect level
EINECS	European Inventory of Existing Commercial Chemical Substances
EC50	half maximal effective concentration
GefStoffV	German Ordinance on Hazardous Substances
GGVSEB	German ordinance for road, rail and inland waterway transportation of dangerous goods
GGVSee	German ordinance for sea transportation of dangerous goods
GLP	Good Laboratory Practice
GMO	Genetic Modified Organism
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
IMDG	International Maritime Dangerous Goods
ISO	International Organization For Standardization
LOAEL	Lowest observed adverse effect level
LOEL	Lowest observed effect level
NOAEL	No observed adverse effect level
NOEC	no observed effect concentration
NOEL	no observed effect level
o. c.	open cup
OECD	Organisation for Economic Cooperation and Development
OEL	Occupational Exposure Limit

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PBT	Persistent, bioaccumulative, toxic
PEC	Predicted effect concentration
PNEC	Predicted no effect concentration
REACH	REACH registration
RID	Convention concerning International Carriage by Rail
STOT	Specific Target Organ Toxicity
SVHC	Substances of Very High Concern
TA	Technical Instructions
TPR	Third Party Representative (Art. 4)
TRGS	Technical Rules for Hazardous Substances
VCI	German chemical industry association
vPvB	very persistent, very bioaccumulative
VOC	volatile organic compounds
VwVwS	German Administrative Regulation on the Classification of Substances Hazardous to Waters into Water Hazard Classes
WGK	Water Hazard Class
WHO	World Health Organization

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**Annex: Exposure Scenarios - Table of content**

ES1 - Use: Manufacture of substances

Main User Group : **SU3** - Industrial uses: Uses of substances as such or in preparations at industrial sites

Environmental release category : **ERC1** - Manufacture of substances

Process category : **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

ES2 - Use: Use as an intermediate

Main User Group : **SU3** - Industrial uses: Uses of substances as such or in preparations at industrial sites

Environmental release category : **ERC6a** - Industrial use resulting in manufacture of another substance (use of intermediates)

Process category : **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

ES3 - Use: Formulation of preparations

Main User Group : **SU3** - Industrial uses: Uses of substances as such or in preparations at industrial sites

Environmental release category : **ERC2** - Formulation of preparations

Process category : **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/

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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

ES4 - Use: Uses in coatings

Main User Group : **SU3** - Industrial uses: Uses of substances as such or in preparations at industrial sites

Environmental release category : **ERC4** - Industrial use of processing aids in processes and products, not becoming part of articles

Process category : **PROC7** - Industrial spraying
PROC8a - Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at non-dedicated facilities
PROC8b - Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities
PROC10 - Roller application or brushing
PROC13 - Treatment of articles by dipping and pouring
PROC15 - Use as laboratory reagent

ES5 - Use: Use in cleaning agents

Main User Group : **SU3** - Industrial uses: Uses of substances as such or in preparations at industrial sites

Environmental release category : **ERC4** - Industrial use of processing aids in processes and products, not becoming part of articles

Process category : **PROC7** - Industrial spraying
PROC8a - Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at non-dedicated facilities
PROC8b - Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities
PROC10 - Roller application or brushing
PROC15 - Use as laboratory reagent

ES6 - Use: Use in agrochemicals, Drum/batch transfers

Main User Group : **SU22** - Professional uses: Public domain (administration, education, entertainment, services, craftsmen)

Environmental release category : **ERC8d** - Wide dispersive outdoor use of processing aids in open systems

Process category : **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

ES7 - Use: Use in agrochemicals, Application type:, Spray treatment

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Main User Group : **SU22** - Professional uses: Public domain (administration, education, entertainment, services, craftsmen)

Environmental release category : **ERC8d** - Wide dispersive outdoor use of processing aids in open systems

Process category : **PROC11** - Non industrial spraying

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1. Short title of exposure scenario - ES1: Manufacture of substances

Main User Group : **SU3** - Industrial uses: Uses of substances as such or in preparations at industrial sites

Environmental release category : **ERC1** - Manufacture of substances

Process category : **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

2.1. Contributing scenario controlling environmental exposure for: ERC1: Manufacture of substances

Product characteristics

Amount used

Daily amount per site : <= 220 tons/day
Fraction tonnage per region : 100 %

Environmental factors not influenced by risk management

Flow rate : 1175000 m³/d
Dilution Factor (River) : 4.2
Dilution Factor (Coastal Areas) : 100

Other given operational conditions affecting environmental exposure

Exposure Type : Continuous exposure
Number of emission days per year : 300
Emission or Release Factor: Air : 0.05 %
Emission or Release Factor: Water : 0.004 %
Emission or Release Factor: Soil : 0 %

Technical conditions and measures / Organizational measures

Air

Risk management measures : Waste gases are treated by incineration or by an activated carbon filter.

Remarks : Procedural and/or control technologies are used to minimize emissions and the resulting exposure during purification or cleaning and maintenance procedures.

Water

Risk management measures : Disposal to treatment plant.

Remarks : Procedural and/or control technologies are used to minimize emissions and the resulting exposure during purification or cleaning and maintenance procedures.

Soil

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Risk management measures : No application of sludge to soil, Sealing of all relevant soil surfaces in the facility., No exposure expected

Remarks : Procedural and/or control technologies are used to minimize emissions and the resulting exposure during purification or cleaning and maintenance procedures.

Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant : Onsite STP
Flow rate of sewage treatment plant effluent : 367200 m³/d
Effectiveness : 87.46 %
Sludge Treatment : Sewage sludge incineration

Conditions and measures related to external treatment of waste for disposal

Waste treatment : Sludge must be disposed of to a waste incineration plant., Liquid and/or solid waste is treated by incineration., Waste water should be treated in a waste water treatment plant.

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

Product characteristics

Remarks : Covers percentage substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid
Conditions : and <= 40 °C

Frequency and duration of use

duration of activity : < 8 h

Human factors not influenced by risk management

Dermal exposure : <= 240 cm²

Other given operational conditions affecting worker exposure

Outdoor / Indoor : Indoor use.

Technical conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour)., Handle substance within a closed system.

Organisational measures to prevent / limit release, dispersion and exposure

Advanced (industrial) exposure controls assumed.

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

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

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

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Product characteristics

Remarks : Covers percentage substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid
Conditions : and <= 40 °C

Frequency and duration of use

duration of activity : < 8 h

Human factors not influenced by risk management

Demal exposure : <= 480 cm²

Other given operational conditions affecting worker exposure

Outdoor / Indoor : Indoor use.

Technical conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour)., Use in closed, continuous process with occasional controlled exposure with local exhaust ventilation
Effectiveness: 90 %

Organisational measures to prevent / limit release, dispersion and exposure

Advanced (industrial) exposure controls assumed.

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

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

2.4. Contributing scenario controlling worker exposure for: PROC3: Use in closed batch process (synthesis or formulation)

Product characteristics

Remarks : Covers percentage substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid
Conditions : and <= 40 °C

Frequency and duration of use

duration of activity : < 8 h

Human factors not influenced by risk management

Demal exposure : <= 240 cm²

Other given operational conditions affecting worker exposure

Outdoor / Indoor : Indoor use.

Technical conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour)., Use in closed batch process with occasional controlled exposure with local exhaust ventilation
Effectiveness: 90 %

Organisational measures to prevent / limit release, dispersion and exposure

Advanced (industrial) exposure controls assumed.

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

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

**2.5. Contributing scenario controlling worker exposure for:
PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises****Product characteristics**

Remarks	:	Covers percentage substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	liquid
Conditions	:	and <= 40 °C

Frequency and duration of use

duration of activity	:	< 8 h
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Human factors not influenced by risk management

Demal exposure	:	<= 480 cm ²
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Other given operational conditions affecting worker exposure

Outdoor / Indoor	:	Indoor use.
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Technical conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour)., Use in semi-closed batch process with occasional controlled exposure with local exhaust ventilation
Effectiveness: 90 %

Organisational measures to prevent / limit release, dispersion and exposure

Advanced (industrial) exposure controls assumed.

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

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

**2.6. Contributing scenario controlling worker exposure for:
PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities****Product characteristics**

Remarks	:	Covers percentage substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	liquid
Conditions	:	and <= 40 °C

Frequency and duration of use

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duration of activity : < 8 h

Human factors not influenced by risk management

Demal exposure : <= 960 cm²

Other given operational conditions affecting worker exposure

Outdoor / Indoor : Indoor use.

Technical conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).
with local exhaust ventilation
Effectiveness: 90 %

Organisational measures to prevent / limit release, dispersion and exposure

Advanced (industrial) exposure controls assumed.

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

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

**2.7. Contributing scenario controlling worker exposure for:
PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large
containers at dedicated facilities**

Product characteristics

Remarks : Covers percentage substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid
Conditions : and <= 40 °C

Frequency and duration of use

duration of activity : < 8 h

Human factors not influenced by risk management

Demal exposure : <= 960 cm²

Other given operational conditions affecting worker exposure

Outdoor / Indoor : Indoor use.

Technical conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour)., Use in semi-closed batch process with occasional controlled exposure with local exhaust ventilation
Effectiveness: 95 %

Organisational measures to prevent / limit release, dispersion and exposure

Advanced (industrial) exposure controls assumed.

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

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

**2.8. Contributing scenario controlling worker exposure for:
PROC15: Use as laboratory reagent**

Product characteristics

Remarks : Covers percentage substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid
Conditions : and <= 40 °C

Frequency and duration of use

duration of activity : < 8 h

Human factors not influenced by risk management

Dermal exposure : <= 240 cm²

Other given operational conditions affecting worker exposure

Outdoor / Indoor : Indoor use.

Technical conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).
with local exhaust ventilation
Effectiveness: 90 %

Organisational measures to prevent / limit release, dispersion and exposure

Advanced (industrial) exposure controls assumed.

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

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

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**3. Exposure estimation and reference to its source****Environment**

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Level of Exposure	RCR	Remarks
ERC1	Used CHESAR model.		Fresh water	0.001 mg/l	0.012	
ERC1	Used CHESAR model.		Fresh water sediment	0.013 mg/kg dry weight	0.012	
ERC1	Used CHESAR model.		Marine water	0.000064 mg/l	< 0.01	
ERC1	Used CHESAR model.		Marine sediment	0.00061 mg/kg dry weight	< 0.01	
ERC1	Used CHESAR model.		STP	0.003 mg/l	< 0.01	
ERC1	Used CHESAR model.		Soil	0.005 mg/kg dry weight	0.038	
ERC1	Used CHESAR model.		Humans via the environment	0.007 mg/kg bodyweight/day	0.013	

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Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	RCR	Remarks
PROC1	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - systemic	0.058 mg/m ³	< 0.01	
PROC1	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - systemic	0.23 mg/m ³	0.01	
PROC1	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - local	0.058 mg/m ³	< 0.01	
PROC1	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - local	0.23 mg/m ³	0.01	
PROC1	ECETOC TRA v3 (2012)		Worker - dermal, long-term - systemic	0.003 mg/kg bw/day	< 0.01	
PROC1	Qualitative approach used to conclude safe use.		Worker - contact with eyes			see section 8.
PROC1	ECETOC TRA v3 (2012)		Worker - combined, long-term - systemic		< 0.01	
PROC1	ECETOC TRA v3 (2012)		Worker - combined, short-term - systemic		0.01	
PROC2	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - systemic	0.576 mg/m ³	0.052	
PROC2	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - systemic	2.303 mg/m ³	0.105	
PROC2	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - local	0.576 mg/m ³	0.052	
PROC2	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - local	2.303 mg/m ³	0.105	
PROC2	ECETOC TRA v3 (2012)		Worker - dermal, long-term - systemic	0.137 mg/kg bw/day	< 0.01	
PROC2	Qualitative approach used		Worker - contact with			see section 8.

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	to conclude safe use.		eyes			
PROC2	ECETOC TRA v3 (2012)		Worker - combined, long-term - systemic		0.059	
PROC2	ECETOC TRA v3 (2012)		Worker - combined, short-term - systemic		0.105	
PROC3	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - systemic	1.728 mg/m ³	0.157	
PROC3	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - systemic	6.91 mg/m ³	0.314	
PROC3	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - local	1.728 mg/m ³	0.157	
PROC3	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - local	6.91 mg/m ³	0.314	
PROC3	ECETOC TRA v3 (2012)		Worker - dermal, long-term - systemic	0.069 mg/kg bw/day	< 0.01	
PROC3	Qualitative approach used to conclude safe use.		Worker - contact with eyes			see section 8.
PROC3	ECETOC TRA v3 (2012)		Worker - combined, long-term - systemic		0.16	
PROC3	ECETOC TRA v3 (2012)		Worker - combined, short-term - systemic		0.314	
PROC4	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - systemic	2.879 mg/m ³	0.262	
PROC4	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - systemic	11.52 mg/m ³	0.524	
PROC4	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - local	2.879 mg/m ³	0.262	
PROC4	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - local	11.52 mg/m ³	0.524	
PROC4	ECETOC TRA v3 (2012)		Worker -	0.686 mg/kg	0.033	

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	v3 (2012)		dermal, long-term - systemic	bw/day		
PROC4	Qualitative approach used to conclude safe use.		Worker - contact with eyes			see section 8.
PROC4	ECETOC TRA v3 (2012)		Worker - combined, long-term - systemic		0.295	
PROC4	ECETOC TRA v3 (2012)		Worker - combined, short-term - systemic		0.524	
PROC8a	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - systemic	5.759 mg/m ³	0.524	
PROC8a	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - systemic	11.52 mg/m ³	0.524	
PROC8a	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - local	5.759 mg/m ³	0.524	
PROC8a	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - local	11.52 mg/m ³	0.524	
PROC8a	ECETOC TRA v3 (2012)		Worker - dermal, long-term - systemic	1.371 mg/kg bw/day	0.067	
PROC8a	Qualitative approach used to conclude safe use.		Worker - contact with eyes			see section 8.
PROC8a	ECETOC TRA v3 (2012)		Worker - combined, long-term - systemic		0.59	
PROC8a	ECETOC TRA v3 (2012)		Worker - combined, short-term - systemic		0.524	
PROC8b	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - systemic	1.44 mg/m ³	0.131	
PROC8b	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - systemic	5.759 mg/m ³	0.262	
PROC8b	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - local	1.44 mg/m ³	0.131	

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PROC8b	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - local	5.759 mg/m ³	0.262	
PROC8b	ECETOC TRA v3 (2012)		Worker - dermal, long-term - systemic	1.371 mg/kg bw/day	0.067	
PROC8b	Qualitative approach used to conclude safe use.		Worker - contact with eyes			see section 8.
PROC8b	ECETOC TRA v3 (2012)		Worker - combined, long-term - systemic		0.198	
PROC8b	ECETOC TRA v3 (2012)		Worker - combined, short-term - systemic		0.262	
PROC15	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - systemic	2.879 mg/m ³	0.262	
PROC15	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - systemic	11.52 mg/m ³	0.524	
PROC15	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - local	2.879 mg/m ³	0.262	
PROC15	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - local	11.52 mg/m ³	0.524	
PROC15	ECETOC TRA v3 (2012)		Worker - dermal, long-term - systemic	0.034 mg/kg bw/day	< 0.01	
PROC15	Qualitative approach used to conclude safe use.		Worker - contact with eyes			see section 8.
PROC15	ECETOC TRA v3 (2012)		Worker - combined, long-term - systemic		0.263	
PROC15	ECETOC TRA v3 (2012)		Worker - combined, short-term - systemic		0.524	

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

For scaling see:

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ECETOC TRA, or, EUSES v2.1, Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

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**1. Short title of exposure scenario - ES2: Use as an intermediate**

Main User Group	:	SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category	:	ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)
Process category	:	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

2.1. Contributing scenario controlling environmental exposure for: ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)**Amount used**

Daily amount per site	:	<= 3.5 tons/day
Fraction tonnage per region	:	100 %

Frequency and duration of use

Continuous exposure	:	300 days/year
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Environmental factors not influenced by risk management

Flow rate	:	18000 m ³ /d
Dilution Factor (River)	:	10
Dilution Factor (Coastal Areas)	:	100

Other given operational conditions affecting environmental exposure

Number of emission days per year	:	300
Emission or Release Factor: Air	:	0.005 %
Emission or Release Factor: Water	:	0.3 %
Emission or Release Factor: Soil	:	0.1 %

Technical conditions and measures / Organizational measures**Air**

Risk management measures	:	Minimise exposure by enclosing the operation or equipment and provide extract ventilation at openings, Apply RMM according to the european solvents directive to limit air emissions.
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Water

Risk management measures	:	Waste water should be treated in a waste water treatment plant., Wastewater resulting from cleaning procedures is disposed off via sewage treatment plant.
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Soil

Risk management measures	:	No application of sludge to soil
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**Conditions and measures related to municipal sewage treatment plant**

Type of Sewage Treatment Plant	: Municipal STP
Flow rate of sewage treatment plant effluent	: 2000 m ³ /d
Effectiveness	: 87.5 %
Sludge Treatment	: No application of sludge to soil

Conditions and measures related to external treatment of waste for disposal

Waste treatment	: Waste gases incinerated., Liquid and/or solid waste is treated by incineration., All waste gases should be treated in such way that the maximum allowable VOC emission based on EU solvent directive is not exceeded.
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**2.2. Contributing scenario controlling worker exposure for:
PROC1: Use in closed process, no likelihood of exposure**

Product characteristics

Remarks	: Covers percentage substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	: liquid
Conditions	: and <= 40 °C

Frequency and duration of use

duration of activity	: < 8 h
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Human factors not influenced by risk management

Demal exposure	: <= 240 cm ²
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Other given operational conditions affecting worker exposure

Outdoor / Indoor	: Indoor use.
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Technical conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour)., Handle substance within a closed system.

Organisational measures to prevent / limit release, dispersion and exposure

Advanced (industrial) exposure controls assumed.

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

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

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

Product characteristics

Remarks	: Covers percentage substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	: liquid
Conditions	: and <= 40 °C

Frequency and duration of use

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duration of activity : < 8 h

Human factors not influenced by risk management

Demal exposure : <= 480 cm²

Other given operational conditions affecting worker exposure

Outdoor / Indoor : Indoor use.

Technical conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour)., Use in closed, continuous process with occasional controlled exposure with local exhaust ventilation
Effectiveness: 90 %

Organisational measures to prevent / limit release, dispersion and exposure

Advanced (industrial) exposure controls assumed.

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

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

2.4. Contributing scenario controlling worker exposure for: PROC3: Use in closed batch process (synthesis or formulation)

Product characteristics

Remarks : Covers percentage substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid
Conditions : and <= 40 °C

Frequency and duration of use

duration of activity : < 8 h

Human factors not influenced by risk management

Demal exposure : <= 240 cm²

Other given operational conditions affecting worker exposure

Outdoor / Indoor : Indoor use.

Technical conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour)., Use in closed batch process with occasional controlled exposure with local exhaust ventilation
Effectiveness: 90 %

Organisational measures to prevent / limit release, dispersion and exposure

Advanced (industrial) exposure controls assumed.

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

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

**2.5. Contributing scenario controlling worker exposure for:
PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises**

Product characteristics

Remarks : Covers percentage substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid
Conditions : and <= 40 °C

Frequency and duration of use

duration of activity : < 8 h

Human factors not influenced by risk management

Demal exposure : <= 480 cm²

Other given operational conditions affecting worker exposure

Outdoor / Indoor : Indoor use.

Technical conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour)., Use in semi-closed batch process with occasional controlled exposure with local exhaust ventilation
Effectiveness: 90 %

Organisational measures to prevent / limit release, dispersion and exposure

Advanced (industrial) exposure controls assumed.

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

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

**2.6. Contributing scenario controlling worker exposure for:
PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities**

Product characteristics

Remarks : Covers percentage substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid
Conditions : and <= 40 °C

Frequency and duration of use

duration of activity : < 8 h

Human factors not influenced by risk management

Demal exposure : <= 960 cm²

Other given operational conditions affecting worker exposure

Outdoor / Indoor : Indoor use.

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Technical conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).
with local exhaust ventilation
Effectiveness: 90 %

Organisational measures to prevent / limit release, dispersion and exposure

Advanced (industrial) exposure controls assumed.

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

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

2.7. Contributing scenario controlling worker exposure for: PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities

Product characteristics

Remarks : Covers percentage substance in the product up to 100 % (unless
stated differently).
Physical Form (at time of use) : liquid
Conditions : and <= 40 °C

Frequency and duration of use

duration of activity : < 8 h

Human factors not influenced by risk management

Demal exposure : <= 960 cm²

Other given operational conditions affecting worker exposure

Outdoor / Indoor : Indoor use.

Technical conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour)., Use in semi-closed batch
process with occasional controlled exposure
with local exhaust ventilation
Effectiveness: 95 %

Organisational measures to prevent / limit release, dispersion and exposure

Advanced (industrial) exposure controls assumed.

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

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

2.8. Contributing scenario controlling worker exposure for:

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**PROC15: Use as laboratory reagent****Product characteristics**

Remarks : Covers percentage substance in the product up to 100 % (unless stated differently).
 Physical Form (at time of use) : liquid
 Conditions : and <= 40 °C

Frequency and duration of use

duration of activity : < 8 h

Human factors not influenced by risk management

Dermal exposure : <= 240 cm²

Other given operational conditions affecting worker exposure

Outdoor / Indoor : Indoor use.

Technical conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).
 with local exhaust ventilation
 Effectiveness: 90 %

Organisational measures to prevent / limit release, dispersion and exposure

Advanced (industrial) exposure controls assumed.

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

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

3. Exposure estimation and reference to its source**Environment**

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Level of Exposure	RCR	Remarks
ERC6a	Used CHESAR model.		Fresh water	0.066 mg/l	0.745	
ERC6a	Used CHESAR model.		Marine water	0.007 mg/l	0.745	
ERC6a	Used CHESAR model.		Fresh water sediment	0.625 mg/kg dry weight	0.745	
ERC6a	Used CHESAR model.		Marine sediment	0.062 mg/kg dry weight	0.745	
ERC6a	Used CHESAR model.		STP	0.66 mg/l	0.66	
ERC6a	Used CHESAR model.		Soil	0.000015 mg/kg dry weight	< 0.01	
ERC6a	Used CHESAR model.		Humans via the environment	0.002 mg/kg bw/day	< 0.01	

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Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	RCR	Remarks
PROC1	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - systemic	0.058 mg/m ³	< 0.01	
PROC1	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - systemic	0.23 mg/m ³	0.01	
PROC1	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - local	0.058 mg/m ³	< 0.01	
PROC1	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - local	0.23 mg/m ³	0.01	
PROC1	ECETOC TRA v3 (2012)		Worker - dermal, long-term - systemic	0.003 mg/kg bw/day	< 0.01	
PROC1	Qualitative approach used to conclude safe use.		Worker - contact with eyes			see section 8.
PROC1	ECETOC TRA v3 (2012)		Worker - combined, long-term - systemic		< 0.01	
PROC1	ECETOC TRA v3 (2012)		Worker - combined, short-term - systemic		0.01	
PROC2	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - systemic	0.576 mg/m ³	0.052	
PROC2	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - systemic	2.303 mg/m ³	0.105	
PROC2	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - local	0.576 mg/m ³	0.052	
PROC2	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - local	2.303 mg/m ³	0.105	
PROC2	ECETOC TRA v3 (2012)		Worker - dermal, long-term - systemic	0.137 mg/kg bw/day	< 0.01	
PROC2	Qualitative approach used		Worker - contact with			see section 8.

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	to conclude safe use.		eyes			
PROC2	ECETOC TRA v3 (2012)		Worker - combined, long-term - systemic		0.059	
PROC2	ECETOC TRA v3 (2012)		Worker - combined, short-term - systemic		0.105	
PROC3	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - systemic	1.728 mg/m ³	0.157	
PROC3	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - systemic	6.91 mg/m ³	0.314	
PROC3	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - local	1.728 mg/m ³	0.157	
PROC3	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - local	6.91 mg/m ³	0.314	
PROC3	ECETOC TRA v3 (2012)		Worker - dermal, long-term - systemic	0.069 mg/kg bw/day	< 0.01	
PROC3	Qualitative approach used to conclude safe use.		Worker - contact with eyes			see section 8.
PROC3	ECETOC TRA v3 (2012)		Worker - combined, long-term - systemic		0.16	
PROC3	ECETOC TRA v3 (2012)		Worker - combined, short-term - systemic		0.314	
PROC4	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - systemic	2.879 mg/m ³	0.262	
PROC4	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - systemic	11.52 mg/m ³	0.524	
PROC4	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - local	2.879 mg/m ³	0.262	
PROC4	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - local	11.52 mg/m ³	0.524	
PROC4	ECETOC TRA v3 (2012)		Worker -	0.686 mg/kg	0.033	

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	v3 (2012)		dermal, long-term - systemic	bw/day		
PROC4	Qualitative approach used to conclude safe use.		Worker - contact with eyes			see section 8.
PROC4	ECETOC TRA v3 (2012)		Worker - combined, long-term - systemic		0.295	
PROC4	ECETOC TRA v3 (2012)		Worker - combined, short-term - systemic		0.524	
PROC8a	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - systemic	5.759 mg/m ³	0.524	
PROC8a	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - systemic	11.52 mg/m ³	0.524	
PROC8a	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - local	5.759 mg/m ³	0.524	
PROC8a	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - local	11.52 mg/m ³	0.524	
PROC8a	ECETOC TRA v3 (2012)		Worker - dermal, long-term - systemic	1.371 mg/kg bw/day	0.067	
PROC8a	Qualitative approach used to conclude safe use.		Worker - contact with eyes			see section 8.
PROC8a	ECETOC TRA v3 (2012)		Worker - combined, long-term - systemic		0.59	
PROC8a	ECETOC TRA v3 (2012)		Worker - combined, short-term - systemic		0.524	
PROC8b	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - systemic	1.44 mg/m ³	0.131	
PROC8b	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - systemic	5.759 mg/m ³	0.262	
PROC8b	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - local	1.44 mg/m ³	0.131	

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PROC8b	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - local	5.759 mg/m ³	0.262	
PROC8b	ECETOC TRA v3 (2012)		Worker - dermal, long-term - systemic	1.371 mg/kg bw/day	0.067	
PROC8b	Qualitative approach used to conclude safe use.		Worker - contact with eyes			see section 8.
PROC8b	ECETOC TRA v3 (2012)		Worker - combined, long-term - systemic		0.198	
PROC8b	ECETOC TRA v3 (2012)		Worker - combined, short-term - systemic		0.262	
PROC15	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - systemic	2.879 mg/m ³	0.262	
PROC15	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - systemic	11.52 mg/m ³	0.524	
PROC15	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - local	2.879 mg/m ³	0.262	
PROC15	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - local	11.52 mg/m ³	0.524	
PROC15	ECETOC TRA v3 (2012)		Worker - dermal, long-term - systemic	0.034 mg/kg bw/day	< 0.01	
PROC15	Qualitative approach used to conclude safe use.		Worker - contact with eyes			see section 8.
PROC15	ECETOC TRA v3 (2012)		Worker - combined, long-term - systemic		0.263	
PROC15	ECETOC TRA v3 (2012)		Worker - combined, short-term - systemic		0.524	

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

For scaling see:

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ECETOC TRA, or, EUSES v2.1, Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

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**1. Short title of exposure scenario - ES3: Formulation of preparations**

Main User Group : **SU3** - Industrial uses: Uses of substances as such or in preparations at industrial sites

Environmental release category : **ERC2** - Formulation of preparations

Process category : **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.
PROC15 - Use as laboratory reagent

2.1. Contributing scenario controlling environmental exposure for: ERC2: Formulation of preparations**Amount used**

Daily amount per site : <= 7 tons/day
Fraction tonnage per region : 100 %

Frequency and duration of use

Continuous exposure : 300 days/year

Environmental factors not influenced by risk management

Flow rate : 18000 m³/d
Dilution Factor (River) : 10
Dilution Factor (Coastal Areas) : 100

Other given operational conditions affecting environmental exposure

Number of emission days per year : 300
Emission or Release Factor: Air : 0.25 %
Emission or Release Factor: Water : 0.15 %
Emission or Release Factor: Soil : 0.01 %

Technical conditions and measures / Organizational measures**Air**

Risk management measures : Minimise exposure by enclosing the operation or equipment and provide extract ventilation at openings, Waste gases are treated by incineration or by an activated carbon filter., The expected exposure level is minimal., Apply RMM according to the european solvents directive to limit air emissions.

Remarks : Procedural and/or control technologies are used to minimize emissions and the resulting exposure during purification or cleaning and maintenance procedures.

Water

Risk management measures : Wastewater resulting from cleaning procedures is disposed off via sewage treatment plant.

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Remarks : Procedural and/or control technologies are used to minimize emissions and the resulting exposure during purification or cleaning and maintenance procedures.

Soil

Risk management measures : No application of sludge to soil, Sealing of all relevant soil surfaces in the facility.

Remarks : Procedural and/or control technologies are used to minimize emissions and the resulting exposure during purification or cleaning and maintenance procedures.

Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant : Municipal STP

Flow rate of sewage treatment plant effluent : 2000 m³/d

Sludge Treatment : No application of sludge to soil

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

Product characteristics

Remarks : Covers percentage substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid
Conditions : and <= 40 °C

Frequency and duration of use

duration of activity : < 8 h

Human factors not influenced by risk management

Dermal exposure : <= 240 cm²

Other given operational conditions affecting worker exposure

Outdoor / Indoor : Indoor use.

Technical conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour)., Handle substance within a closed system.

Organisational measures to prevent / limit release, dispersion and exposure

Advanced (industrial) exposure controls assumed.

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

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

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

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**Product characteristics**

Remarks : Covers percentage substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid
Conditions : and <= 40 °C

Frequency and duration of use

duration of activity : < 8 h

Human factors not influenced by risk management

Demal exposure : <= 480 cm²

Other given operational conditions affecting worker exposure

Outdoor / Indoor : Indoor use.

Technical conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour)., Use in closed, continuous process with occasional controlled exposure with local exhaust ventilation
Effectiveness: 90 %

Organisational measures to prevent / limit release, dispersion and exposure

Advanced (industrial) exposure controls assumed.

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

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

**2.4. Contributing scenario controlling worker exposure for:
PROC3: Use in closed batch process (synthesis or formulation)****Product characteristics**

Remarks : Covers percentage substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid
Conditions : and <= 40 °C

Frequency and duration of use

duration of activity : < 8 h

Human factors not influenced by risk management

Demal exposure : <= 240 cm²

Other given operational conditions affecting worker exposure

Outdoor / Indoor : Indoor use.

Technical conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour)., Use in closed batch process with occasional controlled exposure with local exhaust ventilation
Effectiveness: 90 %

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**Organisational measures to prevent / limit release, dispersion and exposure**

Advanced (industrial) exposure controls assumed.

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

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

**2.5. Contributing scenario controlling worker exposure for:
PROC5: Mixing or blending in batch processes for formulation of preparations and articles
(multistage and/ or significant contact)**

Product characteristics

Remarks : Covers percentage substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid
Conditions : and <= 40 °C

Frequency and duration of use

duration of activity : < 8 h

Human factors not influenced by risk management

Demal exposure : <= 480 cm²

Other given operational conditions affecting worker exposure

Outdoor / Indoor : Indoor use.

Technical conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).
with local exhaust ventilation
Effectiveness: 90 %

Organisational measures to prevent / limit release, dispersion and exposure

Advanced (industrial) exposure controls assumed.

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

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

**2.6. Contributing scenario controlling worker exposure for:
PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large
containers at non-dedicated facilities**

Product characteristics

Remarks : Covers percentage substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid
Conditions : and <= 40 °C

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**Frequency and duration of use**

duration of activity : < 8 h

Human factors not influenced by risk managementDermal exposure : <= 960 cm²**Other given operational conditions affecting worker exposure**

Outdoor / Indoor : Indoor use.

Technical conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).
with local exhaust ventilation
Effectiveness: 90 %

Organisational measures to prevent / limit release, dispersion and exposure

Advanced (industrial) exposure controls assumed.

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

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

**2.7. Contributing scenario controlling worker exposure for:
PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large
containers at dedicated facilities**

Product characteristics

Remarks : Covers percentage substance in the product up to 100 % (unless
stated differently).
Physical Form (at time of use) : liquid
Conditions : and <= 40 °C

Frequency and duration of use

duration of activity : < 8 h

Human factors not influenced by risk managementDermal exposure : <= 960 cm²**Other given operational conditions affecting worker exposure**

Outdoor / Indoor : Indoor use.

Technical conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour)., Use in semi-closed batch
process with occasional controlled exposure
with local exhaust ventilation
Effectiveness: 95 %

Organisational measures to prevent / limit release, dispersion and exposure

Advanced (industrial) exposure controls assumed.

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

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

2.8. Contributing scenario controlling worker exposure for: PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Product characteristics

Remarks : Covers percentage substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid
Conditions : and <= 40 °C

Frequency and duration of use

duration of activity : < 8 h

Human factors not influenced by risk management

Demal exposure : <= 480 cm²

Other given operational conditions affecting worker exposure

Outdoor / Indoor : Indoor use.

Technical conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour)., Use in semi-closed batch process with occasional controlled exposure with local exhaust ventilation
Effectiveness: 90 %

Organisational measures to prevent / limit release, dispersion and exposure

Advanced (industrial) exposure controls assumed.

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

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

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

Product characteristics

Remarks : Covers percentage substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid
Conditions : and <= 40 °C

Frequency and duration of use

duration of activity : < 8 h

Human factors not influenced by risk management

Demal exposure : <= 240 cm²

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**Other given operational conditions affecting worker exposure**

Outdoor / Indoor : Indoor use.

Technical conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).
 with local exhaust ventilation
 Effectiveness: 90 %

Organisational measures to prevent / limit release, dispersion and exposure

Advanced (industrial) exposure controls assumed.

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

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

3. Exposure estimation and reference to its source**Environment**

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Level of Exposure	RCR	Remarks
ERC2	Used CHESAR model.		Fresh water	0.063 mg/l	0.713	
ERC2	Used CHESAR model.		Fresh water sediment	0.599 mg/kg dry weight	0.714	
ERC2	Used CHESAR model.		Marine water	0.006 mg/l	0.713	
ERC2	Used CHESAR model.		Marine sediment	0.06 mg/kg dry weight	0.713	
ERC2	Used CHESAR model.		STP	0.631 mg/l	0.631	
ERC2	Used CHESAR model.		Soil	0.00068 mg/kg dry weight	< 0.01	
ERC2	Used CHESAR model.		Humans via the environment	0.003 mg/kg bodyweight/day	< 0.01	

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Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	RCR	Remarks
PROC1	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - systemic	0.058 mg/m ³	< 0.01	
PROC1	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - systemic	0.23 mg/m ³	0.01	
PROC1	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - local	0.058 mg/m ³	< 0.01	
PROC1	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - local	0.23 mg/m ³	0.01	
PROC1	ECETOC TRA v3 (2012)		Worker - dermal, long-term - systemic	0.003 mg/kg bw/day	< 0.01	
PROC1	Qualitative approach used to conclude safe use.		Worker - contact with eyes			see section 8.
PROC1	ECETOC TRA v3 (2012)		Worker - combined, long-term - systemic		< 0.01	
PROC1	ECETOC TRA v3 (2012)		Worker - combined, short-term - systemic		0.01	
PROC2	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - systemic	0.576 mg/m ³	0.052	
PROC2	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - systemic	2.303 mg/m ³	0.105	
PROC2	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - local	0.576 mg/m ³	0.052	
PROC2	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - local	2.303 mg/m ³	0.105	
PROC2	ECETOC TRA v3 (2012)		Worker - dermal, long-term - systemic	0.137 mg/kg bw/day	< 0.01	
PROC2	Qualitative approach used		Worker - contact with			see section 8.

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	to conclude safe use.		eyes			
PROC2	ECETOC TRA v3 (2012)		Worker - combined, long-term - systemic		0.059	
PROC2	ECETOC TRA v3 (2012)		Worker - combined, short-term - systemic		0.105	
PROC3	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - systemic	1.728 mg/m ³	0.157	
PROC3	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - systemic	6.91 mg/m ³	0.314	
PROC3	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - local	1.728 mg/m ³	0.157	
PROC3	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - local	6.91 mg/m ³	0.314	
PROC3	ECETOC TRA v3 (2012)		Worker - dermal, long-term - systemic	0.069 mg/kg bw/day	< 0.01	
PROC3	Qualitative approach used to conclude safe use.		Worker - contact with eyes			see section 8.
PROC3	ECETOC TRA v3 (2012)		Worker - combined, long-term - systemic		0.16	
PROC3	ECETOC TRA v3 (2012)		Worker - combined, short-term - systemic		0.314	
PROC5	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - systemic	2.879 mg/m ³	0.262	
PROC5	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - systemic	11.52 mg/m ³	0.524	
PROC5	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - local	2.879 mg/m ³	0.262	
PROC5	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - local	11.52 mg/m ³	0.524	
PROC5	ECETOC TRA v3 (2012)		Worker -	1.371 mg/kg	0.067	

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	v3 (2012)		dermal, long-term - systemic	bw/day		
PROC5	Qualitative approach used to conclude safe use.		Worker - contact with eyes			see section 8.
PROC5	ECETOC TRA v3 (2012)		Worker - combined, long-term - systemic		0.329	
PROC5	ECETOC TRA v3 (2012)		Worker - combined, short-term - systemic		0.524	
PROC8a	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - systemic	5.759 mg/m ³	0.524	
PROC8a	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - systemic	11.52 mg/m ³	0.524	
PROC8a	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - local	5.759 mg/m ³	0.524	
PROC8a	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - local	11.52 mg/m ³	0.524	
PROC8a	ECETOC TRA v3 (2012)		Worker - dermal, long-term - systemic	1.371 mg/kg bw/day	0.067	
PROC8a	Qualitative approach used to conclude safe use.		Worker - contact with eyes			see section 8.
PROC8a	ECETOC TRA v3 (2012)		Worker - combined, long-term - systemic		0.59	
PROC8a	ECETOC TRA v3 (2012)		Worker - combined, short-term - systemic		0.524	
PROC8b	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - systemic	1.44 mg/m ³	0.131	
PROC8b	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - systemic	5.759 mg/m ³	0.262	
PROC8b	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - local	1.44 mg/m ³	0.131	

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PROC8b	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - local	5.759 mg/m ³	0.262	
PROC8b	ECETOC TRA v3 (2012)		Worker - dermal, long-term - systemic	1.371 mg/kg bw/day	0.067	
PROC8b	Qualitative approach used to conclude safe use.		Worker - contact with eyes			see section 8.
PROC8b	ECETOC TRA v3 (2012)		Worker - combined, long-term - systemic		0.198	
PROC8b	ECETOC TRA v3 (2012)		Worker - combined, short-term - systemic		0.262	
PROC9	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - systemic	2.879 mg/m ³	0.262	
PROC9	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - systemic	11.52 mg/m ³	0.524	
PROC9	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - local	2.879 mg/m ³	0.262	
PROC9	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - local	11.52 mg/m ³	0.524	
PROC9	ECETOC TRA v3 (2012)		Worker - dermal, long-term - systemic	0.686 mg/kg bw/day	0.033	
PROC9	Qualitative approach used to conclude safe use.		Worker - contact with eyes			see section 8.
PROC9	ECETOC TRA v3 (2012)		Worker - combined, long-term - systemic		0.295	
PROC9	ECETOC TRA v3 (2012)		Worker - combined, short-term - systemic		0.524	
PROC15	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - systemic	2.879 mg/m ³	0.262	
PROC15	ECETOC TRA v3 (2012)		Worker - inhalative, short-term -	11.52 mg/m ³	0.524	

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PROC15	ECETOC TRA v3 (2012)		systemic Worker - inhalative, long-term - local	2.879 mg/m ³	0.262	
PROC15	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - local	11.52 mg/m ³	0.524	
PROC15	ECETOC TRA v3 (2012)		Worker - dermal, long-term - systemic	0.034 mg/kg bw/day	< 0.01	
PROC15	Qualitative approach used to conclude safe use.		Worker - contact with eyes			see section 8.
PROC15	ECETOC TRA v3 (2012)		Worker - combined, long-term - systemic		0.263	
PROC15	ECETOC TRA v3 (2012)		Worker - combined, short-term - systemic		0.524	

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

For scaling see:

ECETOC TRA, or, EUSES v2.1, Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

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**1. Short title of exposure scenario - ES4: Uses in coatings**

Main User Group : **SU3** - Industrial uses: Uses of substances as such or in preparations at industrial sites

Environmental release category : **ERC4** - Industrial use of processing aids in processes and products, not becoming part of articles

Process category : **PROC7** - Industrial spraying
PROC8a - Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at non-dedicated facilities
PROC8b - Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities
PROC10 - Roller application or brushing
PROC13 - Treatment of articles by dipping and pouring
PROC15 - Use as laboratory reagent

**2.1. Contributing scenario controlling environmental exposure for:
ERC4: Industrial use of processing aids in processes and products, not becoming part of articles****Amount used**

Daily amount per site : <= 1.6 tons/day
Fraction tonnage per region : 100 %

Frequency and duration of use

Continuous exposure : 300 days/year

Environmental factors not influenced by risk management

Flow rate : 18000 m³/d
Dilution Factor (River) : 10
Dilution Factor (Coastal Areas) : 100

Other given operational conditions affecting environmental exposure

Number of emission days per year : 300
Emission or Release Factor: Air : 49 %
Emission or Release Factor: Water : 0.6 %
Emission or Release Factor: Soil : 0 %

Technical conditions and measures / Organizational measures**Air**

Risk management measures : Minimise exposure by enclosing the operation or equipment and provide extract ventilation at openings, Waste air should be treated to minimize the release of volatile substance by at least 90%, e.g. thermal or catalytic oxidation., Apply RMM according to the european solvents directive to limit air emissions.

Remarks : Procedural and/or control technologies are used to minimize emissions and the resulting exposure during purification or cleaning and maintenance procedures.

Water

Risk management measures : Wastewater resulting from cleaning procedures is disposed off via sewage treatment plant.

Remarks : Procedural and/or control technologies are used to minimize emissions and the resulting exposure during purification or cleaning

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and maintenance procedures.

Soil

Risk management measures : No application of sludge to soil, Sealing of all relevant soil surfaces in the facility.

Remarks : Procedural and/or control technologies are used to minimize emissions and the resulting exposure during purification or cleaning and maintenance procedures.

Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant : Municipal STP

Flow rate of sewage treatment plant effluent : 2000 m³/d

Sludge Treatment : No application of sludge to soil

**2.2. Contributing scenario controlling worker exposure for:
PROC7: Industrial spraying**

Product characteristics

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

Physical Form (at time of use) : liquid

Conditions : and <= 40 °C

Frequency and duration of use

duration of activity : < 8 h

Human factors not influenced by risk management

Demal exposure : <= 1500 cm²

Other given operational conditions affecting worker exposure

Outdoor / Indoor : Indoor use.

Technical conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).

with local exhaust ventilation

Effectiveness: 95 %

Organisational measures to prevent / limit release, dispersion and exposure

Advanced (industrial) exposure controls assumed.

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

Wear a respirator conforming to EN140 with Type AP2 filter or better.

Effectiveness: 90 %

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

Effectiveness: 90 %

2.3. Contributing scenario controlling worker exposure for:

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**PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities****Product characteristics**

Remarks : Covers percentage substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid
Conditions : and <= 40 °C

Frequency and duration of use

duration of activity : < 8 h

Human factors not influenced by risk management

Dermal exposure : <= 960 cm²

Other given operational conditions affecting worker exposure

Outdoor / Indoor : Indoor use.

Technical conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).
with local exhaust ventilation
Effectiveness: 90 %

Organisational measures to prevent / limit release, dispersion and exposure

Advanced (industrial) exposure controls assumed.

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

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

**2.4. Contributing scenario controlling worker exposure for:
PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities****Product characteristics**

Remarks : Covers percentage substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid
Conditions : and <= 40 °C

Frequency and duration of use

duration of activity : < 8 h

Human factors not influenced by risk management

Dermal exposure : <= 960 cm²

Other given operational conditions affecting worker exposure

Outdoor / Indoor : Indoor use.

Technical conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour)., Use in semi-closed batch process with occasional controlled exposure with local exhaust ventilation
Effectiveness: 95 %

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Organisational measures to prevent / limit release, dispersion and exposure

Advanced (industrial) exposure controls assumed.

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

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

2.5. Contributing scenario controlling worker exposure for: PROC10: Roller application or brushing

Product characteristics

Remarks : Covers percentage substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid
Conditions : and <= 40 °C

Frequency and duration of use

duration of activity : < 8 h

Human factors not influenced by risk management

Dermal exposure : <= 960 cm²

Other given operational conditions affecting worker exposure

Outdoor / Indoor : Indoor use.

Technical conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).
with local exhaust ventilation
Effectiveness: 90 %

Organisational measures to prevent / limit release, dispersion and exposure

Advanced (industrial) exposure controls assumed.

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

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

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

Product characteristics

Remarks : Covers percentage substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid
Conditions : and <= 40 °C

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**Frequency and duration of use**

duration of activity : < 8 h

Human factors not influenced by risk management

Demal exposure : <= 480 cm²

Other given operational conditions affecting worker exposure

Outdoor / Indoor : Indoor use.

Technical conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).
with local exhaust ventilation
Effectiveness: 90 %

Organisational measures to prevent / limit release, dispersion and exposure

Advanced (industrial) exposure controls assumed.

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

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

**2.7. Contributing scenario controlling worker exposure for:
PROC15: Use as laboratory reagent**

Product characteristics

Remarks : Covers percentage substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid
Conditions : and <= 40 °C

Frequency and duration of use

duration of activity : < 8 h

Human factors not influenced by risk management

Demal exposure : <= 240 cm²

Other given operational conditions affecting worker exposure

Outdoor / Indoor : Indoor use.

Technical conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).
with local exhaust ventilation
Effectiveness: 90 %

Organisational measures to prevent / limit release, dispersion and exposure

Advanced (industrial) exposure controls assumed.

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

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

3. Exposure estimation and reference to its source**Environment**

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Level of Exposure	RCR	Remarks
ERC4	Used CHESAR model.		Fresh water	0.061 mg/l	0.682	
ERC4	Used CHESAR model.		Fresh water sediment	0.572 mg/kg dry weight	0.682	
ERC4	Used CHESAR model.		Marine water	0.006 mg/l	0.681	
ERC4	Used CHESAR model.		Marine sediment	0.057 mg/kg dry weight	0.681	
ERC4	Used CHESAR model.		STP	0.603 mg/l	0.603	
ERC4	Used CHESAR model.		Soil	0.033 mg/kg dry weight	0.277	
ERC4	Used CHESAR model.		Humans via the environment	0.049 mg/kg bodyweight/day	0.096	

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Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	RCR	Remarks
PROC7	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - systemic	2.879 mg/m ³	0.262	
PROC7	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - systemic	11.52 mg/m ³	0.524	
PROC7	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - local	2.879 mg/m ³	0.262	
PROC7	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - local	11.52 mg/m ³	0.524	
PROC7	ECETOC TRA v3 (2012)		Worker - dermal, long-term - systemic	4.286 mg/kg bw/day	0.209	
PROC7	Qualitative approach used to conclude safe use.		Worker - contact with eyes			see section 8.
PROC7	ECETOC TRA v3 (2012)		Worker - combined, long-term - systemic		0.471	
PROC7	ECETOC TRA v3 (2012)		Worker - combined, short-term - systemic		0.524	
PROC8a	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - systemic	5.759 mg/m ³	0.524	
PROC8a	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - systemic	11.52 mg/m ³	0.524	
PROC8a	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - local	5.759 mg/m ³	0.524	
PROC8a	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - local	11.52 mg/m ³	0.524	
PROC8a	ECETOC TRA v3 (2012)		Worker - dermal, long-term - systemic	1.371 mg/kg bw/day	0.067	
PROC8a	Qualitative approach used		Worker - contact with			see section 8.

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	to conclude safe use.		eyes			
PROC8a	ECETOC TRA v3 (2012)		Worker - combined, long-term - systemic		0.59	
PROC8a	ECETOC TRA v3 (2012)		Worker - combined, short-term - systemic		0.524	
PROC8b	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - systemic	1.44 mg/m ³	0.131	
PROC8b	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - systemic	5.759 mg/m ³	0.262	
PROC8b	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - local	1.44 mg/m ³	0.131	
PROC8b	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - local	5.759 mg/m ³	0.262	
PROC8b	ECETOC TRA v3 (2012)		Worker - dermal, long-term - systemic	1.371 mg/kg bw/day	0.067	
PROC8b	Qualitative approach used to conclude safe use.		Worker - contact with eyes			see section 8.
PROC8b	ECETOC TRA v3 (2012)		Worker - combined, long-term - systemic		0.198	
PROC8b	ECETOC TRA v3 (2012)		Worker - combined, short-term - systemic		0.262	
PROC10	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - systemic	5.759 mg/m ³	0.524	
PROC10	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - systemic	11.52 mg/m ³	0.524	
PROC10	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - local	5.759 mg/m ³	0.524	
PROC10	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - local	11.52 mg/m ³	0.524	
PROC10	ECETOC TRA v3 (2012)		Worker -	2.743 mg/kg	0.134	

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	v3 (2012)		dermal, long-term - systemic	bw/day		
PROC10	Qualitative approach used to conclude safe use.		Worker - contact with eyes			see section 8.
PROC10	ECETOC TRA v3 (2012)		Worker - combined, long-term - systemic		0.657	
PROC10	ECETOC TRA v3 (2012)		Worker - combined, short-term - systemic		0.524	
PROC13	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - systemic	5.759 mg/m ³	0.524	
PROC13	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - systemic	11.52 mg/m ³	0.524	
PROC13	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - local	5.759 mg/m ³	0.524	
PROC13	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - local	11.52 mg/m ³	0.524	
PROC13	ECETOC TRA v3 (2012)		Worker - dermal, long-term - systemic	1.371 mg/kg bw/day	0.067	
PROC13	Qualitative approach used to conclude safe use.		Worker - contact with eyes			see section 8.
PROC13	ECETOC TRA v3 (2012)		Worker - combined, long-term - systemic		0.59	
PROC13	ECETOC TRA v3 (2012)		Worker - combined, short-term - systemic		0.524	
PROC15	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - systemic	2.879 mg/m ³	0.262	
PROC15	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - systemic	11.52 mg/m ³	0.524	
PROC15	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - local	2.879 mg/m ³	0.262	

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PROC15	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - local	11.52 mg/m ³	0.524	
PROC15	ECETOC TRA v3 (2012)		Worker - dermal, long-term - systemic	0.034 mg/kg bw/day	< 0.01	
PROC15	Qualitative approach used to conclude safe use.		Worker - contact with eyes			see section 8.
PROC15	ECETOC TRA v3 (2012)		Worker - combined, long-term - systemic		0.263	
PROC15	ECETOC TRA v3 (2012)		Worker - combined, short-term - systemic		0.524	

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

For scaling see:

ECETOC TRA, or, EUSES v2.1, Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

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**1. Short title of exposure scenario - ES5: Use in cleaning agents**

Main User Group : **SU3** - Industrial uses: Uses of substances as such or in preparations at industrial sites

Environmental release category : **ERC4** - Industrial use of processing aids in processes and products, not becoming part of articles

Process category : **PROC7** - Industrial spraying
PROC8a - Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at non-dedicated facilities
PROC8b - Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities
PROC10 - Roller application or brushing
PROC15 - Use as laboratory reagent

**2.1. Contributing scenario controlling environmental exposure for:
ERC4: Industrial use of processing aids in processes and products, not becoming part of articles****Amount used**

Daily amount per site : <= 5 tons/day
Fraction tonnage per region : 100 %

Frequency and duration of use

Continuous exposure : 20 days/year

Environmental factors not influenced by risk management

Flow rate : 18000 m³/d
Dilution Factor (River) : 10
Dilution Factor (Coastal Areas) : 100

Other given operational conditions affecting environmental exposure

Number of emission days per year : 20
Emission or Release Factor: Air : 50 %
Emission or Release Factor: Water : 0.003 %
Emission or Release Factor: Soil : 0 %

Technical conditions and measures / Organizational measures**Air**

Risk management measures : All waste gases should be treated in such way that the maximum allowable VOC emission based on EU solvent directive is not exceeded.

Water

Risk management measures : Disposal to treatment plant.

Soil

Risk management measures : Avoid subsoil penetration., Sealing of all relevant soil surfaces in the facility., No application of sludge to soil

Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant : Municipal STP
Flow rate of sewage treatment plant effluent : 2000 m³/d

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Sludge Treatment : No application of sludge to soil

Conditions and measures related to external treatment of waste for disposal

Waste treatment : This material and its container must be disposed of in a safe manner., Contain and dispose of waste according to local regulations.

**2.2. Contributing scenario controlling worker exposure for:
PROC7: Industrial spraying**

Product characteristics

Remarks : Covers percentage substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid
Conditions : and <= 40 °C

Frequency and duration of use

duration of activity : < 8 h

Human factors not influenced by risk management

Demal exposure : <= 1500 cm²

Other given operational conditions affecting worker exposure

Outdoor / Indoor : Indoor use.

Technical conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).
with local exhaust ventilation
Effectiveness: 95 %

Organisational measures to prevent / limit release, dispersion and exposure

Advanced (industrial) exposure controls assumed.

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

Wear a respirator conforming to EN140 with Type AP2 filter or better.
Effectiveness: 90 %
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Effectiveness: 90 %

**2.3. Contributing scenario controlling worker exposure for:
PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large
containers at non-dedicated facilities**

Product characteristics

Remarks : Covers percentage substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid
Conditions : and <= 40 °C

Frequency and duration of use

duration of activity : < 8 h

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Human factors not influenced by risk management

Dermal exposure : <= 960 cm²

Other given operational conditions affecting worker exposure

Outdoor / Indoor : Indoor use.

Technical conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).
with local exhaust ventilation
Effectiveness: 90 %

Organisational measures to prevent / limit release, dispersion and exposure

Advanced (industrial) exposure controls assumed.

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

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

2.4. Contributing scenario controlling worker exposure for: PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities

Product characteristics

Remarks : Covers percentage substance in the product up to 100 % (unless
stated differently).
Physical Form (at time of use) : liquid
Conditions : and <= 40 °C

Frequency and duration of use

duration of activity : < 8 h

Human factors not influenced by risk management

Dermal exposure : <= 960 cm²

Other given operational conditions affecting worker exposure

Outdoor / Indoor : Indoor use.

Technical conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour)., Use in semi-closed batch
process with occasional controlled exposure
with local exhaust ventilation
Effectiveness: 95 %

Organisational measures to prevent / limit release, dispersion and exposure

Advanced (industrial) exposure controls assumed.

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

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

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Effectiveness: 90 %

2.5. Contributing scenario controlling worker exposure for: PROC10: Roller application or brushing

Product characteristics

Remarks : Covers percentage substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid
Conditions : and <= 40 °C

Frequency and duration of use

duration of activity : < 8 h

Human factors not influenced by risk management

Dermal exposure : <= 960 cm²

Other given operational conditions affecting worker exposure

Outdoor / Indoor : Indoor use.

Technical conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).
with local exhaust ventilation
Effectiveness: 90 %

Organisational measures to prevent / limit release, dispersion and exposure

Advanced (industrial) exposure controls assumed.

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

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

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

Product characteristics

Remarks : Covers percentage substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid
Conditions : and <= 40 °C

Frequency and duration of use

duration of activity : < 8 h

Human factors not influenced by risk management

Dermal exposure : <= 240 cm²

Other given operational conditions affecting worker exposure

Outdoor / Indoor : Indoor use.

Technical conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).

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with local exhaust ventilation
 Effectiveness: 90 %

Organisational measures to prevent / limit release, dispersion and exposure

Advanced (industrial) exposure controls assumed.

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

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

3. Exposure estimation and reference to its source**Environment**

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Level of Exposure	RCR	Remarks
ERC4	Used CHESAR model.		Fresh water	0.001 mg/l	0.015	
ERC4	Used CHESAR model.		Fresh water sediment	0.012 mg/kg dry weight	0.015	
ERC4	Used CHESAR model.		Marine water	0.00012 mg/l	0.014	
ERC4	Used CHESAR model.		Marine sediment	0.001 mg/kg dry weight	0.014	
ERC4	Used CHESAR model.		STP	0.009 mg/l	< 0.01	
ERC4	Used CHESAR model.		Soil	0.034 mg/kg dry weight	0.283	
ERC4	Used CHESAR model.		Humans via the environment	0.049 mg/kg bodyweight/day	0.096	

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Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	RCR	Remarks
PROC7	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - systemic	2.879 mg/m ³	0.262	
PROC7	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - systemic	11.52 mg/m ³	0.524	
PROC7	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - local	2.879 mg/m ³	0.262	
PROC7	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - local	11.52 mg/m ³	0.524	
PROC7	ECETOC TRA v3 (2012)		Worker - dermal, long-term - systemic	4.286 mg/kg bw/day	0.209	
PROC7	Qualitative approach used to conclude safe use.		Worker - contact with eyes			see section 8.
PROC7	ECETOC TRA v3 (2012)		Worker - combined, long-term - systemic		0.471	
PROC7	ECETOC TRA v3 (2012)		Worker - combined, short-term - systemic		0.524	
PROC8a	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - systemic	5.759 mg/m ³	0.524	
PROC8a	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - systemic	11.52 mg/m ³	0.524	
PROC8a	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - local	5.759 mg/m ³	0.524	
PROC8a	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - local	11.52 mg/m ³	0.524	
PROC8a	ECETOC TRA v3 (2012)		Worker - dermal, long-term - systemic	1.371 mg/kg bw/day	0.067	
PROC8a	Qualitative approach used		Worker - contact with			see section 8.

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	to conclude safe use.		eyes			
PROC8a	ECETOC TRA v3 (2012)		Worker - combined, long-term - systemic		0.59	
PROC8a	ECETOC TRA v3 (2012)		Worker - combined, short-term - systemic		0.524	
PROC8b	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - systemic	1.44 mg/m ³	0.131	
PROC8b	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - systemic	5.759 mg/m ³	0.262	
PROC8b	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - local	1.44 mg/m ³	0.131	
PROC8b	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - local	5.759 mg/m ³	0.262	
PROC8b	ECETOC TRA v3 (2012)		Worker - dermal, long-term - systemic	1.371 mg/kg bw/day	0.067	
PROC8b	Qualitative approach used to conclude safe use.		Worker - contact with eyes			see section 8.
PROC8b	ECETOC TRA v3 (2012)		Worker - combined, long-term - systemic		0.198	
PROC8b	ECETOC TRA v3 (2012)		Worker - combined, short-term - systemic		0.262	
PROC10	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - systemic	5.759 mg/m ³	0.524	
PROC10	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - systemic	11.52 mg/m ³	0.524	
PROC10	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - local	5.759 mg/m ³	0.524	
PROC10	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - local	11.52 mg/m ³	0.524	
PROC10	ECETOC TRA v3 (2012)		Worker -	2.743 mg/kg	0.134	

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	v3 (2012)		dermal, long-term - systemic	bw/day		
PROC10	Qualitative approach used to conclude safe use.		Worker - contact with eyes			see section 8.
PROC10	ECETOC TRA v3 (2012)		Worker - combined, long-term - systemic		0.657	
PROC10	ECETOC TRA v3 (2012)		Worker - combined, short-term - systemic		0.524	
PROC15	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - systemic	2.879 mg/m ³	0.262	
PROC15	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - systemic	11.52 mg/m ³	0.524	
PROC15	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - local	2.879 mg/m ³	0.262	
PROC15	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - local	11.52 mg/m ³	0.524	
PROC15	ECETOC TRA v3 (2012)		Worker - dermal, long-term - systemic	0.034 mg/kg bw/day	< 0.01	
PROC15	Qualitative approach used to conclude safe use.		Worker - contact with eyes			see section 8.
PROC15	ECETOC TRA v3 (2012)		Worker - combined, long-term - systemic		0.263	
PROC15	ECETOC TRA v3 (2012)		Worker - combined, short-term - systemic		0.524	

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

For scaling see:
 ECETOC TRA, or, EUSES v2.1, Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

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**1. Short title of exposure scenario - ES6: Use in agrochemicals, Drum/batch transfers**

Main User Group : **SU22** - Professional uses: Public domain (administration, education, entertainment, services, craftsmen)

Environmental release category : **ERC8d** - Wide dispersive outdoor use of processing aids in open systems

Process category : **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

**2.1. Contributing scenario controlling environmental exposure for:
ERC8d: Wide dispersive outdoor use of processing aids in open systems****2.2. Contributing scenario controlling worker exposure for:
PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities****Product characteristics**

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

Physical Form (at time of use) : liquid

Conditions : and ≤ 40 °C

Frequency and duration of use

duration of activity : < 1 h

Human factors not influenced by risk management

Demal exposure : ≤ 960 cm²

Other given operational conditions affecting worker exposure

Outdoor / Indoor : Outdoor use.

Organisational measures to prevent / limit release, dispersion and exposure

Assumes a good basic standard of occupational hygiene has been implemented.

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

Wear a respirator conforming to EN140 with Type A/P2 filter or better.

Effectiveness: 90 %

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

Effectiveness: 90 %

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2.3. Contributing scenario controlling worker exposure for: PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities

Product characteristics

Remarks : Covers percentage substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid
Conditions : and ≤ 40 °C

Frequency and duration of use

duration of activity : < 1 h

Human factors not influenced by risk management

Demal exposure : ≤ 960 cm²

Other given operational conditions affecting worker exposure

Outdoor / Indoor : Outdoor use.

Technical conditions and measures

Use in semi-dosed batch process with occasional controlled exposure

Organisational measures to prevent / limit release, dispersion and exposure

Assumes a good basic standard of occupational hygiene has been implemented.

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

Wear a respirator conforming to EN140 with Type AP2 filter or better.

Effectiveness: 90 %

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

Effectiveness: 90 %

3. Exposure estimation and reference to its source

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**Workers**

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	RCR	Remarks
PROC8a	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - systemic	2.016 mg/m ³	0.183	
PROC8a	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - systemic	8.064 mg/m ³	0.366	
PROC8a	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - local	2.016 mg/m ³	0.183	
PROC8a	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - local	8.064 mg/m ³	0.366	
PROC8a	ECETOC TRA v3 (2012)		Worker - dermal, long-term - systemic	1.371 mg/kg bw/day	0.067	
PROC8a	Qualitative approach used to conclude safe use.		Worker - contact with eyes			see section 8.
PROC8a	ECETOC TRA v3 (2012)		Worker - combined, long-term - systemic		0.25	
PROC8a	ECETOC TRA v3 (2012)		Worker - combined, short-term - systemic		0.366	
PROC8b	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - systemic	0.806 mg/m ³	0.073	
PROC8b	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - systemic	16.12 mg/m ³	0.733	
PROC8b	ECETOC TRA v3 (2012)		Worker - inhalative, long-term - local	0.806 mg/m ³	0.073	
PROC8b	ECETOC TRA v3 (2012)		Worker - inhalative, short-term - local	16.12 mg/m ³	0.733	
PROC8b	ECETOC TRA v3 (2012)		Worker - dermal, long-term - systemic	1.371 mg/kg bw/day	0.067	
PROC8b	Qualitative approach used		Worker - contact with			see section 8.

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	to conclude safe use.		eyes			
PROC8b	ECETOC TRA v3 (2012)		Worker - combined, long-term - systemic		0.14	
PROC8b	ECETOC TRA v3 (2012)		Worker - combined, short-term - systemic		0.733	

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

For scaling see:

ECETOC TRA, or, EUSES v2.1, Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

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**1. Short title of exposure scenario - ES7: Use in agrochemicals, Application type:, Spray treatment**

Main User Group : **SU22** - Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category : **ERC8d** - Wide dispersive outdoor use of processing aids in open systems
Process category : **PROC11** - Non industrial spraying

2.1. Contributing scenario controlling environmental exposure for: ERC8d: Wide dispersive outdoor use of processing aids in open systems**Amount used**

Amount per use : 3.87 kg/ha
Annual amount for wide disperse uses : <= 1000000 kg

Frequency and duration of use

Single exposure : 3 Times per year:

Other given operational conditions affecting environmental exposure

Exposure Type : ECPA 8d.2.v1
Number of emission days per year : 3
Emission or Release Factor: Air : 100 %
Emission or Release Factor: Water : 2.02 %
Emission or Release Factor: Soil : 0 %

Conditions and measures related to municipal sewage treatment plant

Procedures to limit air emissions from : not applicable
Sewage Treatment Plant

Conditions and measures related to external treatment of waste for disposal

Waste treatment : Dispose of this material and its container at hazardous or special waste collection point., Water from equipment cleaning or remaining mixtures., Waste water or remaining product should be disposed according to the regulations valid for plant protection products., Do not reuse empty containers and dispose of in accordance with the regulations issued by the appropriate local authorities.

2.2. Contributing scenario controlling worker exposure for: PROC11,: Non industrial spraying, Operator**Product characteristics**

Remarks : Covers concentrations up to, 70 %
Physical Form (at time of use) : liquid
Conditions : and <= 40 °C

Frequency and duration of use

duration of activity : 8 h

Other given operational conditions affecting worker exposure

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Outdoor / Indoor : Outdoor use.

Organisational measures to prevent / limit release, dispersion and exposure

Assumes a good basic standard of occupational hygiene has been implemented.

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

Wear suitable coveralls to prevent exposure to the skin.

**2.3. Contributing scenario controlling worker exposure for:
PROC11,: Non industrial spraying, Worker**

Product characteristics

Remarks : Covers concentrations up to, 70 %
Physical Form (at time of use) : liquid
Conditions : and <= 40 °C

Frequency and duration of use

duration of activity : 2 h

Other given operational conditions affecting worker exposure

Outdoor / Indoor : Outdoor use.

Organisational measures to prevent / limit release, dispersion and exposure

Assumes a good basic standard of occupational hygiene has been implemented.

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

Wear suitable coveralls to prevent exposure to the skin.

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**3. Exposure estimation and reference to its source****Environment**

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Level of Exposure	RCR	Remarks
ERC8d	Other consideration (non-standard tool)		Fresh water	0.047 mg/l	0.534	
ERC8d	Other consideration (non-standard tool)		Fresh water sediment	0.0247 mg/kg dry weight	0.0294	
ERC8d	Other consideration (non-standard tool)		Marine water	0.0048 mg/l	0.534	
ERC8d	Other consideration (non-standard tool)		Marine sediment	0.0025 mg/kg dry weight	0.0294	
ERC8d			STP			Not required
ERC8d	Other consideration (non-standard tool)		Soil	0.0000516 mg/kg dry weight	0.00043	

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	RCR	Remarks
PROC11	Used ART model.		Worker - inhalative, long-term - systemic	0.2588 mg/kg bw/day	0.0126	Operator
PROC11	Used ART model.		Worker - inhalative, short-term - systemic	1.0189 mg/kg bw/day	0.0249	Operator
PROC11	Used ART model.		Worker - inhalative, long-term - systemic	0.0664 mg/kg bw/day	0.0032	Worker
PROC11	Used ART model.		Worker - inhalative, short-term - systemic	0.5931 mg/kg bw/day	0.0145	Worker

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

For scaling see:

ECETOC TRA, or, EUSES v2.1, Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures., If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

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