SAFETY DATA SHEET

BLUE CUBE GERMANY ASSETS GMBH & CO. KG

Safety Data Sheet according to Reg. (EU) No 453/2010

Product name: DOWPER™ Solvent

Revision Date: 16.04.2015
Version: 1.1
Print Date: 23.01.2018

BLUE CUBE GERMANY ASSETS GMBH & CO. KG encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

SECTION 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifiers
Product name: DOWPER™ Solvent

Chemical name of the substance: tetrachloroethylene
CASRN: 127-18-4
EC-No.: 204-825-9
REACH Registration Number: 01-2119475329-28-0000

1.2 Relevant identified uses of the substance or mixture and uses advised against
Identified uses: Industrial uses: Manufacture of substance, industrial. Use in surface cleaning (closed systems), industrial. Functional Fluids, industrial. Distribution and (re)packing, industrial. Formulation & (re)packing of substances and mixtures, industrial. Use as a maskant medium scale Use as a maskant Large Scale Professional uses: Professional use in film cleaning and copying.

1.3 Details of the supplier of the safety data sheet
COMPANY IDENTIFICATION
BLUE CUBE GERMANY ASSETS
GMBH & CO. KG
BUETZFLETHER SAND 2
21683 STADE
GERMANY

Customer Information Number: +49 4141 7693000
INFO@OLINBC.com

1.4 EMERGENCY TELEPHONE NUMBER
24-Hour Emergency Contact: +32 3 575 55 55
Local Emergency Contact: +32 3 575 55 55

SECTION 2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008:
Skin irritation - Category 2 - H315

Eye irritation - Category 2 - H319
Skin sensitisation - Sub-category 1B - H317
Carcinogenicity - Category 2 - H351
Specific target organ toxicity - single exposure - Category 3 - H336
Chronic aquatic toxicity - Category 2 - H411
For the full text of the H-Statements mentioned in this Section, see Section 16.

Classification according to EU Directives 67/548/EEC or 1999/45/EC:
Carc.Cat.3 - R40
R43
Irritant - R38
R67
Dangerous for the environment - R51/53
For the full text of the R-phrases mentioned in this Section, see Section 16.

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008:

Hazard pictograms

Signal word: WARNING

Hazard statements

H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.
H351	Suspected of causing cancer.
H411	Toxic to aquatic life with long lasting effects.

Precautionary statements

P201	Obtain special instructions before use.
P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/ physician if you feel unwell.
P362 + P364	Take off contaminated clothing and wash it before reuse.
P502	Refer to manufacturer/ supplier for information on recovery/ recycling.

2.3 Other hazards
no data available

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substance

This product is a substance.

CASRN / EC-No. / Index-No.	REACH Registration Number	Concentration	Component	Classification: REGULATION (EC) No 1272/2008
CASRN 127-18-4 **EC-No.** 204-825-9 **Index-No.** 602-028-00-4	01-2119475329-28	> 99,9 %	Tetrachloroethylene	Skin Irrit. - 2 - H315 Eye Irrit. - 2 - H319 Skin Sens. - 1B - H317 Carc. - 2 - H351 STOT SE - 3 - H336 Aquatic Chronic - 2 - H411

For the full text of the H-Statements mentioned in this Section, see Section 16.

CASRN / EC-No. / Index-No.	Concentration	Component	Classification: 67/548/EEC
CASRN 127-18-4 **EC-No.** 204-825-9 **Index-No.** 602-028-00-4	> 99,9 %	Tetrachloroethylene	Carc.Cat.3 - R40 N - R51 - R53 R43 Xi - R38 R67

For the full text of the R-phrases mentioned in this Section, see Section 16.

SECTION 4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice: First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air. If not breathing, give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc). If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

Skin contact: Remove material from skin immediately by washing with soap and plenty of water. Remove contaminated clothing and shoes while washing. Seek medical attention if irritation persists. Wash clothing before reuse. Discard items which cannot be decontaminated, including leather articles such as shoes, belts and watchbands.

Eye contact: Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist.

Ingestion: If swallowed, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

4.2 Most important symptoms and effects, both acute and delayed: Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

4.3 Indication of any immediate medical attention and special treatment needed
Notes to physician: Skin contact may aggravate preexisting dermatitis. Maintain adequate ventilation and oxygenation of the patient. If burn is present, treat as any thermal burn, after decontamination. Exposure may increase "myocardial irritability". Do not administer sympathomimetic drugs such as epinephrine unless absolutely necessary. Alcohol consumed before or after exposure may increase adverse effects. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

SECTION 5. FIREFIGHTING MEASURES

5.1 Extinguishing media
Suitable extinguishing media: This material does not burn. If exposed to fire from another source, use suitable extinguishing agent for that fire.

Unsuitable extinguishing media: no data available

5.2 Special hazards arising from the substance or mixture
Hazardous combustion products: Fire conditions may cause this product to decompose. Refer to section 10 - Thermal Decomposition.

Unusual Fire and Explosion Hazards: Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.

5.3 Advice for firefighters
Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Do not use direct water stream. May spread fire. This material does not burn. Fight fire for other material that is burning. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

Special protective equipment for firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures: Evacuate area. Only trained and properly protected personnel must be involved in clean-up operations. Keep personnel out of low areas. Keep upwind of spill. Ventilate area of leak or spill. Refer to section 7, Handling, for additional precautionary measures. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

6.2 Environmental precautions: Material will sink in water. Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

6.3 Methods and materials for containment and cleaning up: Small spills: Absorb with materials such as: Bentonite. Sawdust. Clay. Large spills: Contain spilled material if possible. Recover spilled material if possible. Collect in suitable and properly labeled containers. Suitable containers include: Metal drums. See Section 13, Disposal Considerations, for additional information.

6.4 Reference to other sections: References to other sections, if applicable, have been provided in the previous sub-sections.

SECTION 7. HANDLING AND STORAGE

7.1 Precautions for safe handling: Do not swallow. Avoid breathing vapor. Avoid contact with skin and clothing. Wash thoroughly after handling. Keep container closed. Use with adequate ventilation. Do not enter confined spaces unless adequately ventilated. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

7.2 Conditions for safe storage, including any incompatibilities: Store under cover in a dry, clean, cool, well ventilated place away from sunlight. Do not handle or store near an open flame, heat, or sources of ignition. Keep container tightly closed when not in use. Do not store in: Aluminum. Aluminum alloys. Additional storage and handling information on this product may be obtained by calling your sales or customer service contact. Ask for a product brochure.

7.3 Specific end use(s): See the technical data sheet on this product for further information.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
Exposure limits are listed below, if they exist.

Component	Regulation	Type of listing	Value/Notation
Tetrachloroethylene	ACGIH	TWA	25 ppm
	ACGIH	STEL	100 ppm
	ACGIH	TWA	BEI
	ACGIH	STEL	BEI
	Dow IHG	TWA	10 ppm
	GB EH40	TWA	345 mg/m3 50 ppm
	GB EH40	STEL	689 mg/m3 100 ppm

Derived No Effect Level
Workers

Acute - systemic effects		***Acute – local effects***		***Long-term – systemic effects***		***Long-term – local effects***	
Dermal	Inhalation	Dermal	Inhalation	Dermal	Inhalation	Dermal	Inhalation
n.a.	275 mg/m3	n.a.	275 mg/m3	39,4 mg/kg bw/day	138 mg/m3	n.a.	n.a.

Consumers

Acute - systemic effects			***Acute – local effects***		***Long-term – systemic effects***			***Long-term – local effects***	
Dermal	Inhalation	Oral	Dermal	Inhalation	Dermal	Inhalation	Oral	Dermal	Inhalation

n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Predicted No Effect Concentration

Compartment	PNEC	Remarks
Fresh water	0,051 mg/l	
Marine water	0,0051 mg/l	
Intermittent releases	0,0364 mg/l	
STP	11,2 mg/l	
Fresh water sediment	0,903 mg/kg d.w.	
Marine sediment	0,0903 mg/kg d.w.	
Soil	0,01 mg/kg d.w.	

8.2 Exposure controls

Engineering controls: Use engineering controls to maintain airborne level below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use only in enclosed systems or with local exhaust ventilation. Exhaust systems should be designed to move the air away from the source of vapor/aerosol generation and people working at this point. Lethal concentrations may exist in areas with poor ventilation.

Individual protection measures

Eye/face protection: Use safety glasses (with side shields). Safety glasses (with side shields) should be consistent with EN 166 or equivalent.

Skin protection

Hand protection: Use chemical resistant gloves classified under Standard EN374: Protective gloves against chemicals and micro-organisms. Examples of preferred glove barrier materials include: Ethyl vinyl alcohol laminate ("EVAL"). Polyvinyl alcohol ("PVA"). Viton. Examples of acceptable glove barrier materials include: Butyl rubber. When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374) is recommended. When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374) is recommended. NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Other protection: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.

Respiratory protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use an approved respirator. Selection of air-purifying or positive-pressure supplied-air will depend on the specific operation and the potential airborne concentration of the material. For emergency conditions, use an approved positive-pressure self-contained breathing apparatus. In confined or poorly ventilated areas, use an approved self-contained breathing apparatus or positive pressure air line with auxiliary self-contained air supply.

Use the following CE approved air-purifying respirator: Organic vapor cartridge, type A (boiling point >65 ºC)

Environmental exposure controls

See SECTION 7: Handling and storage and SECTION 13: Disposal considerations for measures to prevent excessive environmental exposure during use and waste disposal.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	
Physical state	Liquid.
Color	Colorless
Odor	Characteristic
Odor Threshold	No test data available
pH	Not applicable
Melting point/range	-22 °C *Literature*
Freezing point	-22 °C *Literature*
Boiling point (760 mmHg)	121,4 °C *Literature*
Flash point	**closed cup** *ASTM D 56* (none)
Evaporation Rate (Butyl Acetate = 1)	No test data available
Flammability (solid, gas)	Not applicable to liquids
Lower explosion limit	Not applicable
Upper explosion limit	Not applicable
Vapor Pressure	2,5 kPa at 25 °C *Literature*
Relative Vapor Density (air = 1)	5,76 *Literature*
Relative Density (water = 1)	1,619 at 25 °C *Literature*
Water solubility	0,015 % at 25 °C *Literature*
Partition coefficient: n-octanol/water	log Pow: 2,53 *Measured*
Auto-ignition temperature	Not combustible.
Decomposition temperature	No test data available
Kinematic Viscosity	0,52 mm2/s at 25 °C *Estimated.*
Explosive properties	No
Oxidizing properties	No

9.2 Other information

Molecular weight	165,8 g/mol *Literature*

NOTE: The physical data presented above are typical values and should not be construed as a specification.

SECTION 10. STABILITY AND REACTIVITY

10.1 Reactivity: no data available

10.2 Chemical stability: Stable under recommended storage conditions. See Storage, Section 7.

10.3 Possibility of hazardous reactions: Polymerization will not occur.

10.4 Conditions to avoid: Exposure to elevated temperatures can cause product to decompose. Avoid open flames, welding arcs, or other high temperature sources which induce thermal decomposition. Avoid direct sunlight or ultraviolet sources.

10.5 Incompatible materials: Avoid contact with: Strong bases. Strong oxidizers. Avoid contact with metals such as: Zinc powders. Zinc. Aluminum powders. Magnesium powders. Potassium. Sodium. Avoid unintended contact with: Amines.

10.6 Hazardous decomposition products: Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Hydrogen chloride. Decomposition products can include trace amounts of: Chlorine. Phosgene.

SECTION 11. TOXICOLOGICAL INFORMATION

Toxicological information on this product or its components appear in this section when such data is available.

11.1 Information on toxicological effects
Acute toxicity

Acute oral toxicity
Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.

LD50, rat, > 3 000 mg/kg OECD 401 or equivalent

Acute dermal toxicity
Prolonged skin contact is unlikely to result in absorption of harmful amounts.

LD50, rabbit, > 10 000 mg/kg Other guidelines

Acute inhalation toxicity
In confined or poorly ventilated areas, vapor can readily accumulate and can cause unconsciousness and death. Dizziness may occur at 200 ppm perchloroethylene; progressively higher levels may also cause nasal irritation, nausea, incoordination, drunkenness, and over 1000 ppm, unconsciousness and death. A single brief (minutes)inhalation exposure to levels above 6000 ppm perchloroethylene may be immediately fatal. Based on structural analogy and/or equivocal data in animals, excessive exposure may potentially increase sensitivity to epinephrine and increase myocardial irritability (irregular heartbeats). Alcohol consumed before or after exposure may increase adverse effects.

LC50, rat, 4 Hour, vapour, > 20 mg/l

Skin corrosion/irritation
Brief contact may cause moderate skin irritation with local redness.
Repeated contact may cause skin burns. Symptoms may include pain, severe local redness, swelling, and tissue damage.

Prolonged or repeated exposure may cause defatting of the skin leading to drying or flaking of skin.

Serious eye damage/eye irritation
May cause pain disproportionate to the level of irritation to eye tissues.
May cause slight temporary eye irritation.
Low vapor concentrations may cause eye irritation; these concentrations are easily attainable at room temperature.

Sensitization
Has demonstrated the potential for contact allergy in mice.

For respiratory sensitization:
No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)
May cause drowsiness or dizziness.
Route of Exposure: Inhalation
Target Organs: Central nervous system

Specific Target Organ Systemic Toxicity (Repeated Exposure)
In humans, effects have been reported on the following organs:
Central nervous system.
In animals, effects have been reported on the following organs:
Central nervous system.
Kidney.
Liver.
Observations in animals include:
Anesthetic or narcotic effects.

Carcinogenicity
Perchloroethylene has been shown to increase the incidence of tumors in certain strains of mice and rats. Other long-term inhalation studies in rats failed to show tumorigenic response. Human data are limited and have not established an association between perchloroethylene exposure and cancer. Perchloroethylene is not believed to pose a measurable carcinogenic risk to man when handled as recommended.

Teratogenicity
Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Did not cause birth defects in laboratory animals.

Reproductive toxicity
In laboratory animal studies, effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals. In animal studies, did not interfere with fertility.

Mutagenicity
In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

Aspiration Hazard
Based on physical properties, not likely to be an aspiration hazard.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicological information on this product or its components appear in this section when such data is available.

12.1 Toxicity

Acute toxicity to fish
Material is toxic to aquatic organisms (LC50/EC50/IC50 between 1 and 10 mg/L in the most sensitive species).

LC50, Oncorhynchus mykiss (rainbow trout), flow-through test, 96 Hour, 5 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna (Water flea), static test, 48 Hour, 8,5 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants
EC50, Green algae (Chlamydomonas reinhardtii)., 72 Hour, Growth rate inhibition, 3,64 mg/l, OECD Test Guideline 201 or Equivalent

EC50, Green algae (Chlamydomonas reinhardtii)., 72 Hour, Growth rate inhibition, 1,77 mg/l

Toxicity to bacteria
IC50, Bacteria, 24 Hour, 112 mg/l

Chronic aquatic toxicity
Chronic toxicity to aquatic invertebrates
NOEC, Daphnia magna (Water flea), semi-static test, 28 d, number of offspring, 0,51 mg/l

Toxicity to soil-dwelling organisms
EC50, Eisenia fetida (earthworms), 24 Hour, 113,4 mg/kg

12.2 Persistence and degradability

Biodegradability: Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions. Biodegradation may occur under anaerobic conditions (in the absence of oxygen). Biodegradation rate may increase in soil and/or water with acclimation.

Photodegradation
Sensitizer: Radicaux OH
Atmospheric half-life: 50 d
Method: Estimated.

12.3 Bioaccumulative potential

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient: n-octanol/water(log Pow): 2,53 Measured
Bioconcentration factor (BCF): 49 Lepomis macrochirus (Bluegill sunfish) 21 d Measured

12.4 Mobility in soil

Potential for mobility in soil is high (Koc between 50 and 150).
Partition coefficient(Koc): 141 Estimated.

12.5 Results of PBT and vPvB assessment

This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

12.6 Other adverse effects

This substance is not in Annex I of Regulation (EC) No 1005/2009 on substances that deplete the ozone layer.

SECTION 13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

This product, when being disposed of in its unused and uncontaminated state should be treated as a hazardous waste according to EC Directive 2008/98/EC. Any disposal practices must be in compliance with all national and provincial laws and any municipal or local by-laws governing hazardous waste. For used, contaminated and residual materials additional evaluations may be required. Do not dump into any sewers, on the ground, or into any body of water. DISPOSAL OF CONTACT WATER: Process water in contact with solvent and/or water separators of cleaning or distillation equipment should be treated as hazardous waste. Do not discharge water from water separators to drain.

The definitive assignment of this material to the appropriate EWC group and thus its proper EWC code will depend on the use that is made of this material. Contact the authorized waste disposal services.

SECTION 14. TRANSPORT INFORMATION

Classification for ROAD and Rail transport (ADR/RID):

14.1	**UN number**	UN 1897
14.2	**Proper shipping name**	TETRACHLOROETHYLENE
14.3	**Class**	6.1
14.4	**Packing group**	III
14.5	**Environmental hazards**	Tetrachloroethylene
14.6	**Special precautions for user**	Hazard identification No: 60

Classification for SEA transport (IMO-IMDG):

14.1	**UN number**	UN 1897
14.2	**Proper shipping name**	TETRACHLOROETHYLENE
14.3	**Class**	6.1
14.4	**Packing group**	III
14.5	**Environmental hazards**	Tetrachloroethylene
14.6	**Special precautions for user**	EmS: F-A, S-A
14.7	**Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code**	Not applicable

Classification for AIR transport (IATA/ICAO):

14.1	**UN number**	UN 1897
14.2	**Proper shipping name**	Tetrachloroethylene
14.3	**Class**	6.1
14.4	**Packing group**	III
14.5	**Environmental hazards**	Not applicable
14.6	**Special precautions for user**	No data available.

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

SECTION 15. REGULATORY INFORMATION

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

REACh Regulation (EC) No 1907/2006
This product contains only components that have been either pre-registered , are exempt from registration or are not subject to registration according to Regulation (EC) No. 1907/2006 (REACH)., The aforementioned indications of the REACH registration status are provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. It is the buyer´s/user´s responsibility to ensure that his/her understanding of the regulatory status of this product is correct.

Seveso II - Directive 96/82/EC and its amendments:
Listed in Regulation: Dangerous for the environment
Number in Regulation: 9b
200 t
500 t

15.2 Chemical Safety Assessment
A Chemical Safety Assessment has been carried out for this substance.

SECTION 16. OTHER INFORMATION

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

H315	Causes skin irritation.
H317	May cause an allergic skin reaction.

H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.
H351	Suspected of causing cancer.
H411	Toxic to aquatic life with long lasting effects.

Full text of R-phrases referred to under sections 2 and 3

R38	Irritating to skin.
R40	Limited evidence of a carcinogenic effect.
R43	May cause sensitisation by skin contact.
R51	Toxic to aquatic organisms.
R51/53	Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R53	May cause long-term adverse effects in the aquatic environment.
R67	Vapours may cause drowsiness and dizziness.

Revision

Identification Number: 101198869 / A480 / Issue Date: 16.04.2015 / Version: 1.1
Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

ACGIH	USA. ACGIH Threshold Limit Values (TLV)
BEI	Biological Exposure Indices
Dow IHG	Dow Industrial Hygiene Guideline
GB EH40	UK. EH40 WEL - Workplace Exposure Limits
STEL	Short-term exposure limit
TWA	8-hour, time-weighted average

Information Source and References

This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

BLUE CUBE GERMANY ASSETS GMBH & CO. KG urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.

1. Short title of Exposure Scenario: Manufacture of substance, industrial.

Main User Groups	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	:	**PROC1:** Use in closed process, no likelihood of exposure **PROC2:** Use in closed, continuous process with occasional controlled exposure **PROC3:** Use in closed batch process (synthesis or formulation) **PROC4:** Use in batch and other process (synthesis) where opportunity for exposure arises **PROC8a:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities **PROC15:** Use as laboratory reagent
Environmental Release Categories	:	**ERC1:** Manufacture of substances
Further information	:	**PrC5f:** Not biodegradable.

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

Frequency and duration of use

Continuous exposure	:	365 Emission days/year, Continuous release.

Environment factors not influenced by risk management

Remarks	:	Local Freshwater dilution factor: 287

Technical conditions and measures / Organizational measures

Remarks	:	Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases.
Water	:	Typical onsite wastewater treatment technology provides removal efficiency of (%): (Effectiveness (of a measure): 99,9 %)

Conditions and measures related to municipal sewage treatment plant

Effectiveness (of a measure)	:	92,6 %
Sludge Treatment	:	Do not apply industrial sludge to natural soils.
Remarks	:	Estimated substance removal from wastewater via domestic sewage treatment.
Percentage removed from waste water	:	92,6 %
Remarks	:	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs.

Conditions and measures related to external treatment of waste for disposal

Remarks	:	External recovery and recycling of waste should comply with applicable local and/or national regulations., Dispose of waste or used sacks/containers according to local regulations.

2.2 Contributing scenario controlling worker exposure for: PROCs (all): General measures applicable to all activities

Activity	:	General risk management measures applicable to all activities

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Organisational measures to prevent /limit releases, dispersion and exposure

Avoid all skin contact with product, clean up contamination/spills as soon as they occur. Wear gloves (tested to EN374) if hand contamination likely, wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop., Avoid direct eye contact with product, also via contamination on hands.

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

Activity	:	General exposures Continuous process (closed systems)

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Organisational measures to prevent /limit releases, dispersion and exposure

No other specific measures identified.

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

Activity	:	General exposures Continuous process with sample collection (closed systems)

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Use a sampling system designed to control exposure

Organisational measures to prevent /limit releases, dispersion and exposure

No other specific measures identified.

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

Activity	:	Bulk transfers internal (closed systems)

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Organisational measures to prevent /limit releases, dispersion and exposure
No other specific measures identified.

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

Activity	:	Bulk product storage (closed systems) with sample collection

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Organisational measures to prevent /limit releases, dispersion and exposure
No other specific measures identified.

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

Activity	:	General exposures Use in contained batch processes with sample collection

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures
Provide extract ventilation to points where emissions occur

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

Activity	:	Process sampling

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Use a sampling system designed to control exposure

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

Activity	:	Mixing operations (open systems) Manual small scale

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Ensure operation is undertaken outdoors.

Organisational measures to prevent /limit releases, dispersion and exposure

not applicable

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

not applicable

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

Activity	:	Equipment cleaning and maintenance

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Organisational measures to prevent /limit releases, dispersion and exposure

Drain down system prior to equipment break-in ormaintenance

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

not applicable

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

Activity	:	Bulk transfers internal

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Ensure material transfers are under containment or extract ventilation.

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

Activity	:	Bulk transfers transport (open systems)

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Ensure material transfers are under containment or extract ventilation.

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

Activity	:	Bulk transfers transport (closed systems)

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Organisational measures to prevent /limit releases, dispersion and exposure

Avoid carrying out activities involving exposurefor more than 1 hour

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

Activity	:	Drum and small package filling Automated process with (semi) closed systems.

Product characteristics

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

Physical Form (at time of use) : Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Ensure material transfers are under containment or extract ventilation.

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

Activity : Laboratory activities

Product characteristics

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

Physical Form (at time of use) : Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Organisational measures to prevent /limit releases, dispersion and exposure

No other specific measures identified.

3. Exposure estimation and reference to its source

Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	RCR
ERC1	Used ECETOC TRA model.		Fresh water		0,000079 mg/l	0,0016
			Fresh water sediment		0,0014 mg/kg dry weight (d.w.)	0,7365

			Marine water		0,00019 mg/l	0,0016
			Marine sediment		0,0033 mg/kg dry weight (d.w.)	0,0365
			Soil		0,0084 mg/kg dry weight (d.w.)	0,0365

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	RCR
PROCs (all)	ECETOC TRA v2.0 Worker	General risk management measures applicable to all activities			
PROC1	ECETOC TRA v2.0 Worker	General exposures, Continuous process, (closed systems)	Chronic inhalation systemic exposure	0,1 mg/m³	0,00
			Chronic dermal systemic exposure	0,3 mg/kg bw/day	0,01
			Combined routes		0,01
PROC2	ECETOC TRA v2.0 Worker	General exposures, Continuous process, with sample collection, (closed systems)	Chronic inhalation systemic exposure	69,1 mg/m³	0,50
			Chronic dermal systemic exposure	1,4 mg/kg bw/day	0,03
			Combined routes		0,054
PROC2	ECETOC TRA v2.0 Worker	Bulk transfers, internal, (closed systems)	Chronic inhalation systemic exposure	69,1 mg/m³	0,50
			Chronic dermal systemic exposure	1,4 mg/kg bw/day	0,03
			Combined routes		0,54
PROC2	ECETOC TRA v2.0 Worker	Bulk product storage, (closed systems), with sample collection	Chronic inhalation systemic exposure	69,1 mg/m³	0,50
			Chronic dermal systemic exposure	1,4 mg/kg bw/day	0,03
			Combined routes		0,54
PROC3	ECETOC TRA v2.0 Worker	General exposures, Use in contained batch processes, with sample collection	Chronic inhalation systemic exposure	17,3 mg/m³	0,13
			Chronic dermal systemic exposure	0,3 mg/kg bw/day	0,01
			Combined routes		0,13
PROC1	ECETOC TRA v2.0 Worker	Process sampling	Chronic inhalation systemic exposure	34,5 mg/m³	0,25
			Chronic dermal	0,3 mg/kg	0,01

			systemic exposure	bw/day	
			Combined routes		0,26
PROC4	ECETOC TRA v2.0 Worker	Mixing operations (open systems), Manual, small scale	Chronic inhalation systemic exposure	96,7 mg/m³	0,70
			Chronic dermal systemic exposure	6,9 mg/kg bw/day	0,17
			Combined routes		0,87
PROC8a	ECETOC TRA v2.0 Worker	Equipment cleaning and maintenance	Chronic inhalation systemic exposure	69,1 mg/m³	0,50
			Chronic dermal systemic exposure	13,7 mg/kg bw/day	0,35
			Combined routes		0,85
PROC8b	ECETOC TRA v2.0 Worker	Bulk transfers, internal	Chronic inhalation systemic exposure	10,4 mg/m³	0,08
			Chronic dermal systemic exposure	6,9 mg/kg bw/day	0,17
			Combined routes		0,25
PROC8b	ECETOC TRA v2.0 Worker	Bulk transfers, transport, (open systems)	Chronic inhalation systemic exposure	10,4 mg/m³	0,08
			Chronic dermal systemic exposure	6,9 mg/kg bw/day	0,17
			Combined routes		0,25
PROC9	ECETOC TRA v2.0 Worker	Bulk transfers, transport, (closed systems)	Chronic inhalation systemic exposure	69,1 mg/m³	0,35
			Chronic dermal systemic exposure	6,9 mg/kg bw/day	0,17
			Combined routes		0,52
PROC8b	ECETOC TRA v2.0 Worker	Drum and small package filling, Automated process with (semi) closed systems.	Chronic inhalation systemic exposure	10,4 mg/m³	0,08
			Chronic dermal systemic exposure	6,9 mg/kg bw/day	0,17
			Combined routes		0,25
PROC15	ECETOC TRA v2.0 Worker	Laboratory activities	Chronic inhalation systemic exposure	69,1 mg/m³	0,50
			Chronic dermal systemic exposure	0,3 mg/kg bw/day	0,01
			Combined routes		0,51

ERC1	Manufacture of substances
PROC1	Use in closed process, no likelihood of exposure
PROC15	Use as laboratory reagent
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC3	Use in closed batch process (synthesis or formulation)
PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises
PROC8a	Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities

PROC8b	Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROCs (all)	General measures applicable to all activities

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

Environment - 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. Further details on scaling and control technologies are provided in SpERC factsheet http://cefic.org/en/reach-for-industries-libraries.html.
Health - Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed toat least equivalent levels.

1. Short title of Exposure Scenario: Industrial use in surface cleaning (closed systems).

Main User Groups	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	:	**PROC1:** Use in closed process, no likelihood of exposure **PROC3:** Use in closed batch process (synthesis or formulation) **PROC8a:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities
Environmental Release Categories	:	**ERC7:** Industrial use of substances in closed systems
Further information	:	**PrC5f:** Not biodegradable.

2.1 Contributing scenario controlling environmental exposure for: ERC7: Industrial use of substances in closed systems

Amount used

Daily amount per site	:	13,5 kg/day

Frequency and duration of use

Continuous exposure	:	300 Emission days/year, Continuous release.

Environment factors not influenced by risk management

Remarks	:	Local freshwater dilution factor: 10., Local marine water dilution factor: 100.

Other given operational conditions affecting environmental exposure

Remarks	:	Assumes use of ECSA III type machines or better., Low environmental release, Assumes use of ECSA IV type machines or better.

Technical conditions and measures / Organizational measures

Remarks	:	Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases., Store finished products in closed containers (e.g., bulk tanks, drums, cans).
Air	:	Activated carbon filter to reduce emissions to air.

Conditions and measures related to municipal sewage treatment plant

Effectiveness (of a measure)	:	92,6 %
Remarks	:	Estimated substance removal from wastewater via domestic sewage treatment.
Percentage removed from waste water	:	92,6 %
Remarks	:	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs.
Flow rate of sewage treatment	:	2 000 m3/d

plant effluent
Remarks : Assumed domestic sewage treatment plant flow (m3/d).

Conditions and measures related to external treatment of waste for disposal
Remarks : Incinerate, absorb, or adsorb vapours stripped from solution whenever necessary.

2.2 Contributing scenario controlling worker exposure for: PROCs (all): General measures applicable to all activities

Activity : General risk management measures applicable to all activities

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

Physical Form (at time of use) : Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use
Remarks : Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure
Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Organisational measures to prevent /limit releases, dispersion and exposure
Avoid all skin contact with product, clean up contamination/spills as soon as they occur. Wear gloves (tested to EN374) if hand contamination likely, wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop., Avoid direct eye contact with product, also via contamination on hands.

Conditions and measures related to personal protection, hygiene and health evaluation
Use suitable eye protection.

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

Activity : Storage

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

Physical Form (at time of use) : Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use
Remarks : Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure
Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature

(unless stated differently).

Technical conditions and measures
Store substance within a closed system.

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

Activity	:	Material transfers Filling of articles/equipment (closed systems)

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures
Handle substance within a closed system.

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

Activity	:	General exposures Use in contained batch processes Application of cleaning products in closed systems

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Provide a good standard of controlled ventilation (5 to 10 air changes per hour)., Efficiency of at least 70%.

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

Activity	:	Equipment cleaning and maintenance

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

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

Wear a respirator conforming to EN140 with Type A filter or better., Efficiency of at least 90%.
Wear suitable gloves tested to EN374., Efficiency of at least 80%.

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

Activity	:	Equipment cleaning and maintenance with local exhaust ventilation

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Provide extract ventilation to material transfer points and other openings., Efficiency of at least 90%.

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

Wear suitable gloves tested to EN374., Efficiency of at least 80%.

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

Activity	:	Material transfers Manual

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Provide a good standard of controlled ventilation (5 to 10 air changes per hour)., Efficiency of at least 70%.

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

Wear suitable gloves tested to EN374., Efficiency of at least 80%.

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

Activity	:	Material transfers Manual with local exhaust ventilation

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Ensure material transfers are under containment or extract ventilation., Efficiency of at least 90%.

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374., Efficiency of at least 80%.

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

Activity : Material transfers
Drum/batch transfers

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

Physical Form (at time of use) : Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use
Remarks : Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure
Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures
Use dry break couplings for material transfer., Provide a good standard of controlled ventilation (5 to 10 air changes per hour)., Efficiency of at least 70%.

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374., Efficiency of at least 80%.

3. Exposure estimation and reference to its source

Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	RCR
ERC7	Used ECETOC TRA model.		Fresh water		0,0000171 mg/l	0,000319
			Fresh water sediment		0,0003 mg/kg dry weight (d.w.)	0,0461
			Marine water		0,0000018 mg/l	0,000319
			Marine sediment		0,0000315 mg/kg dry weight (d.w.)	0,000335
			Soil		0,00052 mg/kg dry weight (d.w.)	0,000335

Workers

Contributing Scenario	Exposure Assessment	Specific conditions	Value type	Level of Exposure	RCR

	Method				
PROCs (all)	ECETOC TRA v2.0 Worker	General risk management measures applicable to all activities			
PROC1	ECETOC TRA v2.0 Worker	Storage	Chronic inhalation systemic exposure	0,07 mg/m³	0,50
			Chronic dermal systemic exposure	0,03 mg/kg bw/day	0,03
			Combined routes		0,54
PROC1	ECETOC TRA v2.0 Worker	Material transfers, Filling of articles/equipment, (closed systems)	Chronic inhalation systemic exposure	0,07 mg/m³	0,50
			Chronic dermal local exposure	0,03 mg/kg bw/day	0,17
			Combined routes		0,67
PROC3	ECETOC TRA v2.0 Worker	General exposures, Use in contained batch processes, Application of cleaning products in closed systems	Chronic inhalation systemic exposure	20,73 mg/m³	0,88
			Chronic dermal systemic exposure	0,69 mg/kg bw/day	0,01
			Combined routes		0,88
PROC8a	ECETOC TRA v2.0 Worker	Equipment cleaning and maintenance	Chronic inhalation systemic exposure	34,54 mg/m³	0,50
			Chronic dermal systemic exposure	2,74 mg/kg bw/day	0,03
			Combined routes		0,54
PROC8a	ECETOC TRA v2.0 Worker	Equipment cleaning and maintenance, with local exhaust ventilation	Chronic inhalation systemic exposure	34,54 mg/m³	0,50
			Chronic dermal systemic exposure	2,74 mg/kg bw/day	0,35
			Combined routes		0,85
PROC8a	ECETOC TRA v2.0 Worker	Material transfers, Manual	Chronic inhalation systemic exposure	58,81 mg/m³	0,50
			Chronic dermal systemic exposure	2,74 mg/kg bw/day	0,35
			Combined routes		0,85
PROC8a	ECETOC TRA v2.0 Worker	Material transfers, Manual, with local exhaust ventilation	Chronic inhalation systemic exposure	8,64 mg/m³	0,25
			Chronic dermal systemic exposure	2,74 mg/kg bw/day	0,35
			Combined routes		0,60
PROC8a	ECETOC TRA v2.0 Worker	Material transfers, Drum/batch transfers	Chronic inhalation systemic exposure	51,81 mg/m³	0,08
			Chronic dermal local exposure	2,74 mg/kg bw/day	0,17

			Combined routes		0,25

ERC7	Industrial use of substances in closed systems
PROC1	Use in closed process, no likelihood of exposure
PROC3	Use in closed batch process (synthesis or formulation)
PROC8a	Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities
PROCs (all)	General measures applicable to all activities

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

Environment - 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. Further details on scaling and control technologies are provided in SpERC factsheet http://cefic.org/en/reach-for-industries-libraries.html.
Health - Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed toat least equivalent levels.

1. Short title of Exposure Scenario: Functional Fluids, industrial.

Main User Groups	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	:	**PROC1:** Use in closed process, no likelihood of exposure **PROC3:** Use in closed batch process (synthesis or formulation) **PROC8a:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities
Environmental Release Categories	:	**ERC7:** Industrial use of substances in closed systems
Further information	:	**PrC5f:** Not biodegradable.

2.1 Contributing scenario controlling environmental exposure for: ERC7: Industrial use of substances in closed systems

Amount used

Daily amount per site	:	100 kg/day

Frequency and duration of use

Continuous exposure	:	20 Emission days/year

Environment factors not influenced by risk management

Remarks	:	Local freshwater dilution factor: 10., Local marine water dilution factor: 100.

Other given operational conditions affecting environmental exposure

Remarks	:	Low environmental release, Used in closed system

Technical conditions and measures / Organizational measures

Air	:	Activated carbon filter to reduce emissions to air.
Water	:	Wastewater emission controls are not applicable as there is no direct release to wastewater.
Remarks	:	Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases., Use vapour recovery units when necessary.

Conditions and measures related to municipal sewage treatment plant

Flow rate of sewage treatment plant effluent	:	2,000 m3/d
Remarks	:	Assumed domestic sewage treatment plant flow (m3/d).

2.2 Contributing scenario controlling worker exposure for: PROCs (all): General measures applicable to all activities

Activity	:	General measures applicable to all activities

Product characteristics

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

Physical Form (at time of use) : Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Organisational measures to prevent /limit releases, dispersion and exposure

Avoid all skin contact with product, clean up contamination/spills as soon as they occur. Wear gloves (tested to EN374) if hand contamination likely, wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop., Avoid direct eye contact with product, also via contamination on hands.

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

Use suitable eye protection.

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

Activity : General exposures (closed systems)

Product characteristics

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

Physical Form (at time of use) : Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Organisational measures to prevent /limit releases, dispersion and exposure

No other specific measures identified.

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

Activity : Storage
(closed systems)

Product characteristics

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

Physical Form (at time of use) : Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Organisational measures to prevent /limit releases, dispersion and exposure

No other specific measures identified.

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

Activity : Material transfers
Use in contained batch processes

Product characteristics

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

Physical Form (at time of use) : Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Drain down and flush system prior to equipment opening or maintenance.

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

Activity : Cleaning
(closed systems)

Product characteristics

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

Physical Form (at time of use) : Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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

Activity	:	Cleaning (closed systems)

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Ensure operation is undertaken outdoors.

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

Activity	:	Material transfers

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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

Activity	:	Material transfers

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Ensure operation is undertaken outdoors.

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

Activity	:	Equipment cleaning and maintenance

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Organisational measures to prevent /limit releases, dispersion and exposure

Drain down system prior to equipment break-in ormaintenance

3. Exposure estimation and reference to its source

Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	RCR
ERC7	Used ECETOC TRA model.		Fresh water		0,0000165 mg/l	0,000312
			Fresh water sediment		0,0002914 mg/kg dry weight (d.w.)	0,000339
			Marine water		0,0000017 mg/l	0,000312
			Marine sediment		0,0000297 mg/kg dry weight (d.w.)	0,000328
			Soil		0,0000033 mg/kg dry weight (d.w.)	0,000328

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	RCR
PROCs (all)	ECETOC TRA v2.0 Worker	General risk management measures applicable to all activities			
PROC1	ECETOC TRA v2.0 Worker	General exposures (closed systems)	Chronic inhalation systemic exposure	0,1 mg/m³	0,00
			Chronic dermal systemic exposure	0,3 mg/kg bw/day	0,01
			Combined routes		0,01
PROC1	ECETOC TRA v2.0 Worker	Storage, (closed systems)	Chronic inhalation systemic exposure	0,1 mg/m³	
			Chronic dermal systemic exposure	0,3 mg/kg bw/day	0,01
			Combined routes		0,01
PROC3	ECETOC TRA v2.0 Worker	Material transfers, Use in contained batch processes	Chronic inhalation systemic exposure	34,5 mg/m³	0,25
			Chronic dermal systemic exposure	0,3 mg/kg bw/day	0,01
			Combined routes		0,26
PROC3	ECETOC TRA v2.0 Worker	Cleaning, (closed systems)	Chronic inhalation systemic exposure	120,9 mg/m³	0,88
			Chronic dermal systemic exposure	0,3 mg/kg bw/day	0,01
			Combined routes		0,88
PROC3	ECETOC TRA v2.0 Worker	Cleaning, (closed systems)	Chronic inhalation systemic exposure	120,9 mg/m³	0,88
			Chronic dermal systemic exposure	0,3 mg/kg bw/day	0,01
			Combined routes		0,88
PROC8a	ECETOC TRA v2.0 Worker	Material transfers	Chronic inhalation systemic exposure	120,9 mg/m³	0,88

			Chronic dermal systemic exposure	0,3 mg/kg bw/day	0,01
			Combined routes		0,88
PROC8a	ECETOC TRA v2.0 Worker	Material transfers	Chronic inhalation systemic exposure	120,9 mg/m³	0,88
			Chronic dermal systemic exposure	0,3 mg/kg bw/day	0,01
			Combined routes		0,88
PROC8a	ECETOC TRA v2.0 Worker	Equipment cleaning and maintenance	Chronic inhalation systemic exposure	69,1 mg/m³	0,50
			Chronic dermal systemic exposure	13,7 mg/kg bw/day	0,35
			Combined routes		0,85

ERC7	Industrial use of substances in closed systems
PROC1	Use in closed process, no likelihood of exposure
PROC3	Use in closed batch process (synthesis or formulation)
PROC8a	Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities
PROCs (all)	General measures applicable to all activities

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

Environment - 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.

Further details on scaling and control technologies are provided in SpERC factsheet http://cefic.org/en/reach-for-industries-libraries.html.
Health - Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed toat least equivalent levels.

1. Short title of Exposure Scenario: Professional use in film cleaning and copying.

Main User Groups	:	**SU 22:** Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Sectors of end-use	:	**SU 22:** Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process categories	:	**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
Environmental Release Categories	:	**ERC7:** Industrial use of substances in closed systems
Further information	:	**PrC5f:** Not biodegradable.

2.1 Contributing scenario controlling environmental exposure for: ERC7: Industrial use of substances in closed systems

Amount used

Daily amount per site	:	12 kg/day

Frequency and duration of use

Continuous exposure	:	20 Emission days/year

Environment factors not influenced by risk management

Remarks	:	Local freshwater dilution factor: 10., Local marine water dilution factor: 100.

Other given operational conditions affecting environmental exposure

Emission or Release Factor: Air	:	0,47 %
Emission or Release Factor: Water	:	0,000008 %
Remarks	:	Used in closed system

Technical conditions and measures / Organizational measures

Remarks	:	Use vapour recovery units when necessary., Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases.
Air	:	Activated carbon filter to reduce emissions to air.
Water	:	Wastewater emission controls are not applicable as there is no direct release to wastewater.

Conditions and measures related to municipal sewage treatment plant

Effectiveness (of a measure)	:	92,6 %
Remarks	:	Estimated substance removal from wastewater via domestic sewage treatment.
Percentage removed from waste water	:	92,6 %
Remarks	:	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs.

Flow rate of sewage treatment plant effluent	:	2,000 m3/d
Remarks	:	Assumed domestic sewage treatment plant flow (m3/d).

2.2 Contributing scenario controlling worker exposure for: PROCs (all): General measures applicable to all activities

Activity	:	General measures applicable to all activities

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Organisational measures to prevent /limit releases, dispersion and exposure

Avoid all skin contact with product, clean up contamination/spills as soon as they occur. Wear gloves (tested to EN374) if hand contamination likely, wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop., Avoid direct eye contact with product, also via contamination on hands.

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

Use suitable eye protection.

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

Activity	:	Material transfers Drum/batch transfers (closed systems)

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature

(unless stated differently).

Technical conditions and measures
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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

Activity	:	General exposures Use in contained batch processes with local exhaust ventilation

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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

Activity	:	Material transfers Manual

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Organisational measures to prevent /limit releases, dispersion and exposure
Avoid carrying out activities involving exposurefor more than 1 hour

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

Activity : Equipment cleaning and maintenance

Product characteristics

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

Physical Form (at time of use) : Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

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

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

3. Exposure estimation and reference to its source

Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	RCR
ERC7	Used ECETOC TRA model.		Fresh water		0,0000163 mg/l	0,000319
			Fresh water sediment		0,000288 mg/kg dry weight (d.w.)	0,000964
			Marine water		0,0000017 mg/l	0,000319
			Marine sediment		0,0000303 mg/kg dry weight (d.w.)	0,000335
			Soil			0,000335

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	RCR
PROCs (all)	ECETOC TRA v2.0 Worker	General risk management measures applicable to all activities			
PROC2	ECETOC TRA	Material transfers,	Chronic inhalation	96,7 mg/m³	0,70

	v2.0 Worker	Drum/batch transfers, (closed systems)	systemic exposure		
			Chronic dermal systemic exposure	1,4 mg/kg bw/day	0,03
			Combined routes		0,74
PROC3	ECETOC TRA v2.0 Worker	General exposures, Use in contained batch processes, with local exhaust ventilation	Chronic inhalation systemic exposure	120,9 mg/m³	0,88
			Chronic dermal systemic exposure	0,3 mg/kg bw/day	0,01
			Combined routes		0,88
PROC8a	ECETOC TRA v2.0 Worker	Material transfers, Manual	Chronic inhalation systemic exposure	69,1 mg/m³	0,50
			Acute dermal systemic exposure	6,9 mg/kg bw/day	0,17
			Combined routes		0,67
PROC8a	ECETOC TRA v2.0 Worker	Equipment cleaning and maintenance	Chronic inhalation systemic exposure	69,1 mg/m³	0,50
			Chronic dermal systemic exposure	13,7 mg/kg bw/day	0,35
			Combined routes		0,85

ERC7	Industrial use of substances in closed systems
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC3	Use in closed batch process (synthesis or formulation)
PROC8a	Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities
PROCs (all)	General measures applicable to all activities

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

Environment - 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. Further details on scaling and control technologies are provided in SpERC factsheet http://cefic.org/en/reach-for-industries-libraries.html.

Health - Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed toat least equivalent levels.

1. Short title of Exposure Scenario: Distribution of substance, industrial.

Main User Groups	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	:	**PROC2:** Use in closed, continuous process with occasional controlled exposure **PROC3:** Use in closed batch process (synthesis or formulation) **PROC8a:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities **PROC9:** Transfer of substance or preparation into small containers (dedicated filling line, including weighing) **PROC15:** Use as laboratory reagent
Environmental Release Categories	:	**ERC2:** Formulation of preparations
Further information	:	**ESVOC SpERC 1.1b.v1:** Distribution: Industrial (SU3)

2.1 Contributing scenario controlling environmental exposure for: ERC2: Formulation of preparations

Amount used

Daily amount per site	:	50000 kg/day

Frequency and duration of use

Continuous exposure	:	300 Emission days/year, Continuous release.

Environment factors not influenced by risk management

Dilution Factor (River)	:	10
Dilution Factor (Coastal Areas)	:	100

Technical conditions and measures / Organizational measures

Air	:	Waste gas treatment - catalytic oxidation.

Conditions and measures related to municipal sewage treatment plant

Effectiveness (of a measure)	:	92,6 %
Remarks	:	Estimated substance removal from wastewater via domestic sewage treatment.
Percentage removed from waste water	:	92,6 %
Remarks	:	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs.
Flow rate of sewage treatment plant effluent	:	2 000 m3/d
Remarks	:	Assumed domestic sewage treatment plant flow (m3/d).

2.2 Contributing scenario controlling worker exposure for: PROCs (all): General measures applicable to all activities

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Organisational measures to prevent /limit releases, dispersion and exposure

Avoid all skin contact with product, clean up contamination/spills as soon as they occur. Wear gloves (tested to EN374) if hand contamination likely, wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop., Avoid direct eye contact with product, also via contamination on hands.

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

Use suitable eye protection.

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

Activity	:	Bulk product storage (closed systems) with sample collection

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Organisational measures to prevent /limit releases, dispersion and exposure

No other specific measures identified.

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

Activity	:	Process sampling (closed systems)

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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

Activity	:	Process sampling (closed systems)

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)., or,
Ensure operation is undertaken outdoors.

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

Activity	:	Equipment cleaning and maintenance

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Organisational measures to prevent /limit releases, dispersion and exposure

Drain down system prior to equipment break-in ormaintenance

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

Activity	:	Bulk transfers Dedicated facility

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Organisational measures to prevent /limit releases, dispersion and exposure

Avoid carrying out activities involving exposurefor more than 1 hour

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

Activity	:	Drum/batch transfers Dedicated facility

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Organisational measures to prevent /limit releases, dispersion and exposure

Avoid carrying out activities involving exposurefor more than 1 hour

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

Activity	:	Drum and small package filling Dedicated facility

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Ensure material transfers are under containment or extract ventilation.

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

Activity	:	Laboratory activities

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is

implemented., Assumes activities are at ambient temperature (unless stated differently).

Organisational measures to prevent /limit releases, dispersion and exposure
No other specific measures identified.

3. Exposure estimation and reference to its source

Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	RCR
ERC2	Used ECETOC TRA model.	Distribution: Industrial (SU3)	Fresh water		0,000016 mg/l	0,000312
			Fresh water sediment		0,00028 mg/kg dry weight (d.w.)	0,0289
			Marine water		0,0000017 mg/l	0,000312
			Marine sediment		0,000029 mg/kg dry weight (d.w.)	0,000328
			Soil		0,00032 mg/kg dry weight (d.w.)	0,000328

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	RCR
PROC2	ECETOC TRA v2.0 Worker	Bulk product storage, (closed systems), with sample collection	Chronic inhalation systemic exposure	69,08 mg/m³	0,50
			Chronic dermal systemic exposure	1,37 mg/kg bw/day	0,03
			Combined routes		0,54
PROC3	ECETOC TRA v2.0 Worker	Process sampling, (closed systems)	Chronic inhalation systemic exposure	120,90 mg/m³	0,88
			Chronic dermal systemic exposure	0,34 mg/kg bw/day	0,01
			Combined routes		0,88
PROC8a	ECETOC TRA v2.0 Worker	Equipment cleaning and maintenance	Chronic inhalation systemic exposure	69,08 mg/m³	0,50
			Chronic dermal systemic exposure	1,37 mg/kg bw/day	0,35
			Combined routes		0,85
PROC8b	ECETOC TRA v2.0 Worker	Bulk transfers, Dedicated facility	Chronic inhalation systemic exposure	69,08 mg/m³	0,50
			Chronic dermal systemic exposure	6,86 mg/kg bw/day	0,17

			Combined routes		0,67
PROC8b	ECETOC TRA v2.0 Worker	Drum/batch transfers, Dedicated facility	Chronic inhalation systemic exposure	69,08 mg/m³	0,50
			Chronic dermal systemic exposure	6,86 mg/kg bw/day	0,17
			Combined routes		0,67
PROC9	ECETOC TRA v2.0 Worker	Drum and small package filling, Dedicated facility	Chronic inhalation systemic exposure	34,54 mg/m³	0,25
			Chronic dermal systemic exposure	6,86 mg/kg bw/day	0,17
			Combined routes		0,42
PROC15	ECETOC TRA v2.0 Worker	Laboratory activities	Chronic inhalation systemic exposure	69,08 mg/m³	0,50
			Chronic dermal systemic exposure	0,34 mg/kg bw/day	0,01
			Combined routes		0,51

ERC2	Formulation of preparations
PROC15	Use as laboratory reagent
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC3	Use in closed batch process (synthesis or formulation)
PROC8a	Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities
PROC8b	Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

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

Environment - 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. Further details on scaling and control technologies are provided in SpERC factsheet http://cefic.org/en/reach-for-industries-libraries.html. No additional risk management measures required.
Health - Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed toat least equivalent levels.

1. Short title of Exposure Scenario: Formulation & (re)packing of substances and mixtures, industrial.

Main User Groups	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	:	**PROC1:** Use in closed process, no likelihood of exposure **PROC2:** Use in closed, continuous process with occasional controlled exposure **PROC3:** Use in closed batch process (synthesis or formulation) **PROC4:** Use in batch and other process (synthesis) where opportunity for exposure arises **PROC8a:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities **PROC9:** Transfer of substance or preparation into small containers (dedicated filling line, including weighing) **PROC15:** Use as laboratory reagent
Environmental Release Categories	:	**ERC2:** Formulation of preparations
Further information	:	**ESVOC SpERC 2.2.v1:** Formulation & packing of preparations and mixtures: Industrial (SU10)

2.1 Contributing scenario controlling environmental exposure for: ERC2: Formulation of preparations

Amount used

Daily amount per site	:	5000 kg/day

Frequency and duration of use

Continuous exposure	:	60 Emission days/year, Continuous release.

Environment factors not influenced by risk management

Dilution Factor (River)	:	10
Dilution Factor (Coastal Areas)	:	100

Other given operational conditions affecting environmental exposure

Emission or Release Factor: Air	:	0,015 %
Emission or Release Factor: Water	:	0,0001 %
Emission or Release Factor: Soil	:	0,0001 %

Technical conditions and measures / Organizational measures

Air	:	Treat air emission to provide a typical removal efficiency of (%): (Effectiveness (of a measure): 98,5 %)
Remarks	:	Use vapour recovery units when necessary., Store finished products in closed containers (e.g., bulk tanks, drums, cans).

Conditions and measures related to external treatment of waste for disposal

Remarks	:	Dispose of waste product or used containers according to local regulations., Dispose of waste or used sacks/containers according to local regulations.

2.2 Contributing scenario controlling worker exposure for: PROCs (all): General measures applicable to all activities

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Organisational measures to prevent /limit releases, dispersion and exposure

Avoid all skin contact with product, clean up contamination/spills as soon as they occur. Wear gloves (tested to EN374) if hand contamination likely, wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop., Avoid direct eye contact with product, also via contamination on hands.

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

Use suitable eye protection.

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

Activity	:	General exposures (closed systems)

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Handle substance within a closed system.

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

Activity	:	General exposures (closed systems) Continuous process with sample collection

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Handle substance within a closed system.

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

Wear suitable gloves tested to EN374.

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

Activity	:	General exposures (closed systems) Continuous process with sample collection elevated temperature

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Handle substance within a closed system., Provide a good standard of controlled ventilation (5 to 10 air changes per hour).

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

Wear suitable gloves tested to EN374.

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

Activity	:	General exposures (closed systems) Use in contained batch processes

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)., Handle substance within a closed system.

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

Wear suitable gloves tested to EN374.

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

Activity	:	General exposures (open systems)

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Provide a good standard of controlled ventilation (5 to 10 air changes per hour).

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

Wear suitable gloves tested to EN374.

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

Activity	:	General exposures (open systems) elevated temperature

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Provide extract ventilation to points where emissions occur, Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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

Wear suitable gloves tested to EN374.

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

Activity	:	Transfer from/pouring from containers Manual

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Provide extract ventilation to material transfer points and other openings.

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

Wear suitable gloves tested to EN374.

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

Activity	:	Equipment cleaning and maintenance

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

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

Wear a respirator conforming to EN140 with Type A filter or better., Wear suitable gloves tested to EN374.

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

Activity	:	Transfer from/pouring from containers Manual elevated temperature

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Provide extract ventilation to material transfer points and other openings., Provide a good standard of controlled ventilation (5 to 10 air changes per hour).

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

Wear suitable gloves tested to EN374.

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

Activity	:	Drum/batch transfers Bulk transfers Process sampling

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Provide a good standard of controlled ventilation (5 to 10 air changes per hour).

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

Wear suitable gloves tested to EN374.

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

Activity	:	Drum and small package filling Dedicated facility

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Fill containers/cans at dedicated filling points supplied with local extract ventilation.

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

Wear suitable gloves tested to EN374.

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

Activity	:	Drum and small package filling Dedicated facility elevated temperature

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Fill containers/cans at dedicated filling points supplied with local extract ventilation., Provide a good standard of controlled ventilation (5 to 10 air changes per hour).

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

Wear suitable gloves tested to EN374.

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

Activity	:	Laboratory activities

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Handle substance within a closed system.

3. Exposure estimation and reference to its source

Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	RCR
ERC2	Used ECETOC TRA model.	Formulation & packing of preparations and mixtures: Industrial (SU10)	Fresh water		0,025 mg/l	0,49
			Fresh water sediment		0,44 mg/kg dry weight (d.w.)	0,86
			Marine water		0,0025 mg/l	0,49
			Marine sediment		0,044 mg/kg dry weight (d.w.)	0,49
			Soil		0,0097 mg/kg dry weight (d.w.)	0,49

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	RCR
PROC1	ECETOC TRA v2.0 Worker	General exposures (closed systems)	Chronic inhalation systemic exposure	0,07 mg/m³	0,001
			Chronic dermal systemic exposure	0,03 mg/kg bw/day	0,001
			Combined routes		0,001
PROC2	ECETOC TRA v2.0 Worker	General exposures (closed systems), Continuous process, with sample collection	Chronic inhalation systemic exposure	34,54 mg/m³	0,250
			Chronic dermal systemic exposure	0,27 mg/kg bw/day	0,007
			Combined routes		0,257
PROC2	ECETOC TRA v2.0 Worker	General exposures (closed systems), Continuous process, with sample collection, elevated temperature	Chronic inhalation systemic exposure	51,81 mg/m³	0,375
			Chronic dermal systemic exposure	0,27 mg/kg bw/day	0,007
			Combined routes		0,382
PROC3	ECETOC TRA v2.0 Worker	General exposures (closed systems), Use in contained batch	Chronic inhalation systemic exposure	48,36 mg/m³	0,350

		processes			
			Chronic dermal systemic exposure	0,14 mg/kg bw/day	0,004
			Combined routes		0,354
PROC4	ECETOC TRA v2.0 Worker	General exposures (open systems)	Chronic inhalation systemic exposure	41,45 mg/m³	0,300
			Chronic dermal systemic exposure	1,37 mg/kg bw/day	0,035
			Combined routes		0,335
PROC4	ECETOC TRA v2.0 Worker	General exposures (open systems), elevated temperature	Chronic inhalation systemic exposure	48,36 mg/m³	0,350
			Chronic dermal systemic exposure	1,37 mg/kg bw/day	0,035
			Combined routes		0,385
PROC8a	ECETOC TRA v2.0 Worker	Transfer from/pouring from containers, Manual	Chronic inhalation systemic exposure	34,54 mg/m³	0,250
			Chronic dermal systemic exposure	2,74 mg/kg bw/day	0,070
			Combined routes		0,320
PROC8a	ECETOC TRA v2.0 Worker	Equipment cleaning and maintenance	Chronic inhalation systemic exposure	34,54 mg/m³	0,250
			Chronic dermal systemic exposure	2,74 mg/kg bw/day	0,070
			Combined routes		0,320
PROC8a	ECETOC TRA v2.0 Worker	Transfer from/pouring from containers, Manual, elevated temperature	Chronic inhalation systemic exposure	51,81 mg/m³	0,375
			Chronic dermal systemic exposure	2,74 mg/kg bw/day	0,070
			Combined routes		0,445
PROC8b	ECETOC TRA v2.0 Worker	Drum/batch transfers, Bulk transfers, Process sampling	Chronic inhalation systemic exposure	51,81 mg/m³	0,375
			Chronic dermal systemic exposure	2,74 mg/kg bw/day	0,070
			Combined routes		0,445
PROC9	ECETOC TRA v2.0 Worker	Drum and small package filling, Dedicated facility	Chronic inhalation systemic exposure	34,54 mg/m³	0,250
			Chronic dermal systemic exposure	1,37 mg/kg bw/day	0,035
			Combined routes		0,285
PROC9	ECETOC TRA v2.0 Worker	Drum and small package filling, Dedicated facility, elevated temperature	Chronic inhalation systemic exposure	41,45 mg/m³	0,300
			Chronic dermal systemic exposure	1,37 mg/kg bw/day	0,035
			Combined routes		0,335
PROC15	ECETOC TRA	Laboratory activities	Chronic inhalation	48,36 mg/m³	0,350

	v2.0 Worker		systemic exposure		
			Chronic dermal systemic exposure	0,07 mg/kg bw/day	0,002
			Combined routes		0,352

ERC2	Formulation of preparations
PROC1	Use in closed process, no likelihood of exposure
PROC15	Use as laboratory reagent
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC3	Use in closed batch process (synthesis or formulation)
PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises
PROC8a	Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities
PROC8b	Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

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

Environment - 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. Further details on scaling and control technologies are provided in SpERC factsheet http://cefic.org/en/reach-for-industries-libraries.html. No additional risk management measures required.
Health - Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed toat least equivalent levels.

1. Short title of Exposure Scenario: Use as a maskant, medium scale

Main User Groups	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	:	**PROC1:** Use in closed process, no likelihood of exposure **PROC2:** Use in closed, continuous process with occasional controlled exposure **PROC3:** Use in closed batch process (synthesis or formulation) **PROC4:** Use in batch and other process (synthesis) where opportunity for exposure arises **PROC7:** Industrial spraying **PROC8a:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities **PROC10:** Roller application or brushing **PROC13:** Treatment of articles by dipping and pouring **PROC15:** Use as laboratory reagent
Environmental Release Categories	:	**ERC4:** Industrial use of processing aids in processes and products, not becoming part of articles
Further information	:	**ESVOC SpERC 4.3a.v1:** Uses in Coatings: Industrial (SU3)

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	:	240 kg/day

Frequency and duration of use

Continuous exposure	:	250 Emission days/year, Continuous release.

Environment factors not influenced by risk management

Dilution Factor (River)	:	10
Dilution Factor (Coastal Areas)	:	100

Other given operational conditions affecting environmental exposure

Emission or Release Factor: Air	:	0,08 %
Emission or Release Factor: Water	:	0,003 %

Technical conditions and measures / Organizational measures

Air	:	Treat air emission to provide a typical removal efficiency of (%): (Effectiveness (of a measure): 92 %)
Remarks	:	Use vapour recovery units when necessary.

Conditions and measures related to municipal sewage treatment plant

Flow rate of sewage treatment plant effluent	:	2 000 m3/d

Conditions and measures related to external treatment of waste for disposal

Remarks	:	Dispose of waste product or used containers according to

local regulations., Dispose of waste or used sacks/containers according to local regulations.

2.2 Contributing scenario controlling worker exposure for: PROCs (all): General measures applicable to all activities

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Organisational measures to prevent /limit releases, dispersion and exposure

Avoid all skin contact with product, clean up contamination/spills as soon as they occur. Wear gloves (tested to EN374) if hand contamination likely, wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop., Avoid direct eye contact with product, also via contamination on hands.

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

Use suitable eye protection.

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

Activity	:	General exposures (closed systems) Storage

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Handle substance within a closed system.

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

Activity	:	General exposures (closed systems) Continuous process with sample collection

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Handle substance within a closed system.

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

Wear suitable gloves tested to EN374.

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

Activity	:	Film formation - force drying, stoving and other technologies Use in contained systems elevated temperature

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Handle substance within a closed system., Provide a good standard of controlled ventilation (5 to 10 air changes per hour).

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

Wear suitable gloves tested to EN374.

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

Activity	:	General exposures (closed systems) Use in contained batch processes

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Handle substance within a closed system., Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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

Wear suitable gloves tested to EN374.

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

Activity	:	Film formation - air drying (open systems)

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Provide a good standard of controlled ventilation (5 to 10 air changes per hour).

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

Wear suitable gloves tested to EN374.

2.8 Contributing scenario controlling worker exposure for: PROC7: Industrial spraying

Activity	:	Spraying

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Carry out in a vented booth or extracted enclosure., Provide a good standard of controlled ventilation (5 to 10 air changes per hour).

Organisational measures to prevent /limit releases, dispersion and exposure

Other skin protection measures such as impervious suits and face shields will be required during high dispersion activities e.g. spraying.

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

Wear suitable gloves tested to EN374.

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

Activity	:	Material transfers Non-dedicated facility

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Provide extract ventilation to material transfer points and other openings.

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

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

Activity	:	Equipment cleaning and maintenance

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator conforming to EN140 with Type A filter or better., Wear suitable gloves tested to EN374.

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

Activity	:	Material transfers Dedicated facility

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures
Provide a good standard of controlled ventilation (5 to 10 air changes per hour).

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

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

Activity	:	Roller, spreader, flow application

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Provide extract ventilation to points where emissions occur

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

Wear suitable gloves tested to EN374.

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

Activity	:	Dipping, immersion and pouring

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Provide extract ventilation to points where emissions occur

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

Wear suitable gloves tested to EN374.

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

Activity	:	Dipping, immersion and pouring elevated temperature

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Provide extract ventilation to points where emissions occur, Provide a good standard of controlled ventilation (5 to 10 air changes per hour).

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

Wear suitable gloves tested to EN374.

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

Activity	:	Laboratory activities

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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

Wear suitable gloves tested to EN374.

3. Exposure estimation and reference to its source

Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	RCR
ERC4	Used ECETOC TRA model.	Uses in Coatings: Industrial (SU3)	Fresh water		0,036 mg/l	0,71
			Fresh water sediment		0,64 mg/kg dry weight (d.w.)	0,91
			Marine water		0,036 mg/l	0,71
			Marine sediment		0,64 mg/kg dry weight (d.w.)	0,71
			Soil		0,01 mg/kg dry weight (d.w.)	0,71

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	RCR
PROC1	ECETOC TRA v2.0 Worker	General exposures (closed systems), Storage	Chronic inhalation systemic exposure	0,07 mg/m³	0,001
			Chronic dermal systemic exposure	0,03 mg/kg bw/day	0,001
			Combined routes		0,001
PROC2	ECETOC TRA v2.0 Worker	General exposures (closed systems), Continuous process, with sample collection	Chronic inhalation systemic exposure	34,54 mg/m³	0,250
			Chronic dermal systemic exposure	0,27 mg/kg bw/day	0,007
			Combined routes		0,257
PROC2	ECETOC TRA v2.0 Worker	Film formation - force drying, stoving and other technologies, Use in contained systems, elevated temperature	Chronic inhalation systemic exposure	51,81 mg/m³	0,375
			Chronic dermal systemic exposure	0,27 mg/kg bw/day	0,007
			Combined routes		0,382
PROC3	ECETOC TRA v2.0 Worker	General exposures (closed systems), Use in contained batch processes	Chronic inhalation systemic exposure	48,36 mg/m³	0,350
			Chronic dermal systemic exposure	0,14 mg/kg bw/day	0,004
			Combined routes		0,354
PROC4	ECETOC TRA	Film formation - air	Chronic inhalation	41,45 mg/m³	0,300

	v2.0 Worker	drying, (open systems)	systemic exposure		
			Chronic dermal systemic exposure	1,37 mg/kg bw/day	0,035
			Combined routes		0,335
PROC7	ECETOC TRA v2.0 Worker	Spraying	Chronic inhalation systemic exposure	60,45 mg/m³	0,438
			Chronic dermal systemic exposure	8,57 mg/kg bw/day	0,218
			Combined routes		0,656
PROC8a	ECETOC TRA v2.0 Worker	Material transfers, Non-dedicated facility	Chronic inhalation systemic exposure	34,54 mg/m³	0,250
			Chronic dermal systemic exposure	2,74 mg/kg bw/day	0,070
			Combined routes		0,320
PROC8a	ECETOC TRA v2.0 Worker	Equipment cleaning and maintenance	Chronic inhalation systemic exposure	34,54 mg/m³	0,250
			Chronic dermal systemic exposure	2,74 mg/kg bw/day	0,070
			Combined routes		0,320
PROC8b	ECETOC TRA v2.0 Worker	Material transfers, Dedicated facility	Chronic inhalation systemic exposure	51,81 mg/m³	0,375
			Chronic dermal systemic exposure	2,74 mg/kg bw/day	0,070
			Combined routes		0,445
PROC10	ECETOC TRA v2.0 Worker	Roller, spreader, flow application	Chronic inhalation systemic exposure	34,54 mg/m³	0,250
			Chronic dermal systemic exposure	5,49 mg/kg bw/day	0,139
			Combined routes		0,390
PROC13	ECETOC TRA v2.0 Worker	Dipping, immersion and pouring	Chronic inhalation systemic exposure	34,54 mg/m³	0,250
			Chronic dermal systemic exposure	2,74 mg/kg bw/day	0,070
			Combined routes		0,320
PROC13	ECETOC TRA v2.0 Worker	Dipping, immersion and pouring, elevated temperature	Chronic inhalation systemic exposure	51,81 mg/m³	0,375
			Chronic dermal systemic exposure	2,74 mg/kg bw/day	0,070
			Combined routes		0,445
PROC15	ECETOC TRA v2.0 Worker	Laboratory activities	Chronic inhalation systemic exposure	48,36 mg/m³	0,350
			Chronic dermal systemic exposure	0,07 mg/kg bw/day	0,002
			Combined routes		0,352

ERC4	Industrial use of processing aids in processes and products, not becoming part of articles
PROC1	Use in closed process, no likelihood of exposure
PROC10	Roller application or brushing
PROC13	Treatment of articles by dipping and pouring

PROC15	Use as laboratory reagent
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC3	Use in closed batch process (synthesis or formulation)
PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises
PROC7	Industrial spraying
PROC8a	Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities
PROC8b	Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities

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

Environment - 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. Further details on scaling and control technologies are provided in SpERC factsheet http://cefic.org/en/reach-for-industries-libraries.html. No additional risk management measures required.
Health - Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed toat least equivalent levels.

1. Short title of Exposure Scenario: Use as a maskant, Large Scale

Main User Groups	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	:	**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) **PROC7:** Industrial spraying **PROC8a:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities **PROC10:** Roller application or brushing **PROC13:** Treatment of articles by dipping and pouring **PROC15:** Use as laboratory reagent
Environmental Release Categories	:	**ERC4:** Industrial use of processing aids in processes and products, not becoming part of articles
Further information	:	**ESVOC SpERC 4.3a.v1:** Uses in Coatings: Industrial (SU3)

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	:	800 kg/day

Frequency and duration of use

Continuous exposure	:	300 Emission days/year, Continuous release.

Environment factors not influenced by risk management

Dilution Factor (River)	:	10
Dilution Factor (Coastal Areas)	:	100

Other given operational conditions affecting environmental exposure

Emission or Release Factor: Air	:	0,02 %
Emission or Release Factor: Water	:	0,0009 %

Technical conditions and measures / Organizational measures

Air	:	Treat air emission to provide a typical removal efficiency of (%): (Effectiveness (of a measure): 98 %)
Air	:	Activated carbon filter to reduce emissions to air.
Remarks	:	Use vapour recovery units when necessary., Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases.

Conditions and measures related to municipal sewage treatment plant

Flow rate of sewage treatment plant effluent	:	2 000 m3/d
Remarks	:	Assumed domestic sewage treatment plant flow (m3/d).

Conditions and measures related to external treatment of waste for disposal

Remarks : Dispose of waste product or used containers according to local regulations., Dispose of waste or used sacks/containers according to local regulations.

2.2 Contributing scenario controlling worker exposure for: PROCs (all): General measures applicable to all activities

Product characteristics

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

Physical Form (at time of use) : Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Organisational measures to prevent /limit releases, dispersion and exposure

Avoid all skin contact with product, clean up contamination/spills as soon as they occur. Wear gloves (tested to EN374) if hand contamination likely, wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop., Avoid direct eye contact with product, also via contamination on hands.

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

Use suitable eye protection.

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

Activity : General exposures (closed systems)
Storage

Product characteristics

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

Physical Form (at time of use) : Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Handle substance within a closed system.

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

Activity	:	General exposures (closed systems) Continuous process with sample collection

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Handle substance within a closed system.

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

Wear suitable gloves tested to EN374.

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

Activity	:	Film formation - force drying, stoving and other technologies Use in contained systems elevated temperature

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Handle substance within a closed system., Provide a good standard of controlled ventilation (5 to 10 air changes per hour).

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

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

Activity	:	General exposures (closed systems) Use in contained batch processes

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures
Handle substance within a closed system., Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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

2.7 Contributing scenario controlling worker exposure for: PROC7: Industrial spraying

Activity	:	Spraying (automatic/robotic) elevated temperature

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures
Carry out in a vented booth or extracted enclosure., Provide a good standard of controlled ventilation (5 to 10 air changes per hour).

Organisational measures to prevent /limit releases, dispersion and exposure
Other skin protection measures such as impervious suits and face shields will be required during high dispersion activities e.g. spraying.

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

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

Activity	:	Material transfers Non-dedicated facility

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures
Provide extract ventilation to material transfer points and other openings.

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

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

Activity	:	Equipment cleaning and maintenance

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature

(unless stated differently).

Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator conforming to EN140 with Type A filter or better., Wear suitable gloves tested to EN374.

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

Activity	:	Material transfers Dedicated facility

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures
Provide a good standard of controlled ventilation (5 to 10 air changes per hour).

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

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

Activity	:	Roller, spreader, flow application

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures
Provide extract ventilation to points where emissions occur

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

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

Activity	:	Dipping, immersion and pouring

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures
Provide extract ventilation to points where emissions occur

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

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

Activity	:	Dipping, immersion and pouring elevated temperature

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures
Provide extract ventilation to points where emissions occur, Provide a good standard of controlled ventilation (5 to 10 air changes per hour).

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

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

Activity : Laboratory activities

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

Physical Form (at time of use) : Liquid, vapour pressure 0.5 - 10 kPa at STP

Frequency and duration of use
Remarks : Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure
Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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

3. Exposure estimation and reference to its source

Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	RCR
ERC4	Used ECETOC TRA model.	Uses in Coatings: Industrial (SU3)	Fresh water		0,036 mg/l	0,71
			Fresh water sediment		0,64 mg/kg dry weight (d.w.)	0,91
			Marine water		0,036 mg/l	0,71
			Marine sediment		0,64 mg/kg dry weight (d.w.)	0,71
			Soil		0,01 mg/kg dry weight (d.w.)	0,71

Workers

Contributing Scenario	Exposure Assessment	Specific conditions	Value type	Level of Exposure	RCR

	Method				
PROC1	ECETOC TRA v2.0 Worker	General exposures (closed systems), Storage	Chronic inhalation systemic exposure	0,07 mg/m³	0,001
			Chronic dermal systemic exposure	0,03 mg/kg bw/day	0,001
			Combined routes		0,001
PROC2	ECETOC TRA v2.0 Worker	General exposures (closed systems), Continuous process, with sample collection	Chronic inhalation systemic exposure	34,54 mg/m³	0,250
			Chronic dermal systemic exposure	0,27 mg/kg bw/day	0,007
			Combined routes		0,257
PROC2	ECETOC TRA v2.0 Worker	Film formation - force drying, stoving and other technologies, Use in contained systems, elevated temperature	Chronic inhalation systemic exposure	51,81 mg/m³	0,375
			Chronic dermal systemic exposure	0,27 mg/kg bw/day	0,007
			Combined routes		0,382
PROC3	ECETOC TRA v2.0 Worker	General exposures (closed systems), Use in contained batch processes	Chronic inhalation systemic exposure	48,36 mg/m³	0,350
			Chronic dermal systemic exposure	0,14 mg/kg bw/day	0,004
			Combined routes		0,354
PROC7	ECETOC TRA v2.0 Worker	Spraying (automatic/robotic), elevated temperature	Chronic inhalation systemic exposure	51,81 mg/m³	0,375
			Chronic dermal systemic exposure	8,57 mg/kg bw/day	0,218
			Combined routes		0,593
PROC8a	ECETOC TRA v2.0 Worker	Material transfers, Non-dedicated facility	Chronic inhalation systemic exposure	34,54 mg/m³	0,250
			Chronic dermal systemic exposure	2,74 mg/kg bw/day	0,070
			Combined routes		0,320
PROC8a	ECETOC TRA v2.0 Worker	Equipment cleaning and maintenance	Chronic inhalation systemic exposure	34,54 mg/m³	0,250
			Chronic dermal systemic exposure	2,74 mg/kg bw/day	0,070
			Combined routes		0,320
PROC8b	ECETOC TRA v2.0 Worker	Material transfers, Dedicated facility	Chronic inhalation systemic exposure	51,81 mg/m³	0,375
			Chronic dermal systemic exposure	2,74 mg/kg bw/day	0,070
			Combined routes		0,445
PROC10	ECETOC TRA v2.0 Worker	Roller, spreader, flow application	Chronic inhalation systemic exposure	34,54 mg/m³	0,250

			Chronic dermal systemic exposure	5,49 mg/kg bw/day	0,139
			Combined routes		0,390
PROC13	ECETOC TRA v2.0 Worker	Dipping, immersion and pouring	Chronic inhalation systemic exposure	34,54 mg/m³	0,250
			Chronic dermal systemic exposure	2,74 mg/kg bw/day	0,070
			Combined routes		0,320
PROC13	ECETOC TRA v2.0 Worker	Dipping, immersion and pouring, elevated temperature	Chronic inhalation systemic exposure	51,81 mg/m³	0,375
			Chronic dermal systemic exposure	2,74 mg/kg bw/day	0,070
			Combined routes		0,445
PROC15	ECETOC TRA v2.0 Worker	Laboratory activities	Chronic inhalation systemic exposure	48,36 mg/m³	0,350
			Chronic dermal systemic exposure	0,07 mg/kg bw/day	0,002
			Combined routes		0,352

ERC4	Industrial use of processing aids in processes and products, not becoming part of articles
PROC1	Use in closed process, no likelihood of exposure
PROC10	Roller application or brushing
PROC13	Treatment of articles by dipping and pouring
PROC15	Use as laboratory reagent
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC3	Use in closed batch process (synthesis or formulation)
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

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

Environment - 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. Further details on scaling and control technologies are provided in SpERC factsheet http://cefic.org/en/reach-for-industries-libraries.html. No additional risk management measures required.
Health - Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed toat least equivalent levels.