

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006



TRIBUTYL PHOSPHATE

Version	Revision Date:	SDS Number:	Date of last issue: -
1.0	15.01.2019	103000009257	Country / Language: GB / EN(GB)

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

1.1 Product identifier

Trade name	:	TRIBUTYL PHOSPHATE
Product code	:	04423801
Substance name	:	Tributyl phosphate
Index-No.	:	015-014-00-2
EC-No.	:	204-800-2
REACH Registration Number	:	01-2119492859-14-0000

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

Use of the Sub-	:	Antifoam for industrial application
stance/Mixture	:	Solvents for industrial application

A tabular overview of all uses for which an exposure scenario is provided can be found at the beginning of the annex to this safety data sheet.

1.3 Details of the supplier of the safety data sheet

Supplier	:	LANXESS Deutschland GmbH Production, Technology, Safety & Environment 51369 Leverkusen, Germany
Telephone	:	+4922188852288
E-mail address of person responsible for the SDS	:	infosds@lanxess.com

1.4 Emergency telephone number

0870 190 6777. National Chemical Emergency Centre

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Acute toxicity, Category 4	H302: Harmful if swallowed.
Skin irritation, Category 2	H315: Causes skin irritation.
Carcinogenicity, Category 2	H351: Suspected of causing cancer.
Long-term (chronic) aquatic hazard, Category 3	H412: Harmful to aquatic life with long lasting effects.

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2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms	:	
Signal word	:	Warning
Hazard statements	:	H302 Harmful if swallowed. H315 Causes skin irritation. H351 Suspected of causing cancer. H412 Harmful to aquatic life with long lasting effects.
Precautionary statements	:	Prevention: P201 Obtain special instructions before use. P202 Do not handle until all safety precautions have been read and understood. P264 Wash skin thoroughly after handling. P270 Do not eat, drink or smoke when using this product. P273 Avoid release to the environment. P280 Wear protective gloves/ protective clothing/ eye protection/ face protection. Response: P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth. P308 + P313 IF exposed or concerned: Get medical advice/ attention. P332 + P313 If skin irritation occurs: Get medical advice/ attention. Disposal: P501 Dispose of contents/ container to an approved waste disposal plant.

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.1 Substances

Components

Chemical name	CAS-No. EC-No.	Classification	Concentration (% w/w)
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tributyl phosphate	126-73-8 204-800-2	Acute Tox. 4; H302 Skin Irrit. 2; H315 Carc. 2; H351 Aquatic Chronic 3; H412	>= 90 - <= 100
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For explanation of abbreviations see section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

- General advice : Call a physician immediately.
Show this safety data sheet to the doctor in attendance.
Move out of dangerous area.
Do not leave the victim unattended.
- Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training.
It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
- If inhaled : If breathed in, move person into fresh air.
If unconscious, place in recovery position and seek medical advice.
If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel.
Keep respiratory tract clear.
Loosen tight clothing such as a collar, tie, belt or waistband.
If symptoms persist, call a physician.
- In case of skin contact : Wash skin immediately with plenty of water and soap. Subsequent cleansing with polyethyleneglycol 400, then again with water and soap.
Continue to rinse for at least 10 minutes.
Take off contaminated clothing and shoes immediately.
If skin irritation persists, call a physician.
- In case of eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids.
Continue to rinse for at least 10 minutes.
Remove contact lenses.
Protect unharmed eye.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.
- If swallowed : Rinse mouth with water.
Give small amounts of water to drink.
DO NOT induce vomiting unless directed to do so by a physician or poison control center.

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If vomiting occurs, the head should be kept low so that vomit does not enter the lungs.
Keep respiratory tract clear.
Loosen tight clothing such as a collar, tie, belt or waistband.
Never give anything by mouth to an unconscious person.
If unconscious, place in recovery position and get medical attention immediately.
Take victim immediately to hospital.
If symptoms persist, call a physician.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms	: Eye contact may provoke the following symptoms Pain watering eye redness Skin contact may provoke the following symptoms: Irritation Redness
Risks	: Harmful if swallowed. Causes skin irritation. Suspected of causing cancer.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment	: Treat symptomatically.
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SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media	: In case of fire, use water spray (fog), foam, dry chemical or CO ₂ .
Unsuitable extinguishing media	: None known.

5.2 Special hazards arising from the substance or mixture

Specific hazards during fire-fighting	: In a fire or if heated, a pressure increase will occur and the container may burst. Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Harmful to aquatic life with long lasting effects.
Hazardous combustion products	: Carbon dioxide (CO ₂) Carbon monoxide phosphorus oxide (P ₂ O ₅)

5.3 Advice for firefighters

Special protective equipment	: Fire-fighters should wear appropriate protective equipment
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for firefighters	and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
Further information	: Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions	: No action shall be taken involving any personal risk or without suitable training. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Do not breathe vapours, aerosols. Provide adequate ventilation. In case of inadequate ventilation wear respiratory protection. Put on appropriate personal protection equipment.
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6.2 Environmental precautions

Environmental precautions	: Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.
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6.3 Methods and material for containment and cleaning up

Methods for cleaning up	: Stop leak if safe to do so. Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal.
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6.4 Reference to other sections

For personal protection see section 8.
For disposal considerations see section 13.

SECTION 7: Handling and storage

The information in this section contains generic advice and guidance. The list of Identified Uses in Annex should be consulted for any available use-specific information provided in the Exposure Scenario(s).

7.1 Precautions for safe handling

Advice on safe handling	: For personal protection see section 8. Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and
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understood.
Avoid contact with skin and eyes.
Do not breathe vapours/dust.
Avoid release to the environment.
Use only with adequate ventilation.
In case of insufficient ventilation, wear suitable respiratory equipment.
Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use.
Smoking, eating and drinking should be prohibited in the application area.
Dispose of rinse water in accordance with local and national regulations.

Advice on protection against fire and explosion : Normal measures for preventive fire protection.

Hygiene measures : When using do not eat or drink. When using do not smoke.
Wash hands before breaks and at the end of workday.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep containers sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers.

Electrical installations / working materials must comply with the technological safety standards.

Further information on storage stability : No decomposition if stored and applied as directed.

7.3 Specific end use(s)

Specific use(s) : Antifoam for industrial application
Solvent

SECTION 8: Exposure controls/personal protection

The information in this section contains generic advice and guidance. The list of Identified Uses in Annex should be consulted for any available use-specific information provided in the Exposure Scenario(s).

8.1 Control parameters

Occupational Exposure Limits

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Components	CAS-No.	Value type (Form of exposure)	Control parameters	Basis
tributyl phosphate	126-73-8	TWA	5 mg/m ³	GB EH40
		STEL	5 mg/m ³	GB EH40

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:

Substance name	End Use	Exposure routes	Potential health effects	Value
tributyl phosphate	Workers	Inhalation	Long-term exposure, Systemic effects	3.13 mg/m ³
	Workers	Inhalation	Short-term exposure, Systemic effects	12.52 mg/m ³
	Workers	Inhalation	Long-term exposure, Local effects	3.13 mg/m ³
	Workers	Inhalation	Short-term exposure, Local effects	12.52 mg/m ³
	Workers	Dermal	Long-term exposure, Systemic effects	0.44 mg/kg bw/day
	Workers	Dermal	Short-term exposure, Systemic effects	1.78 mg/kg bw/day
	Workers	Dermal	Long-term exposure, Local effects	0.44 mg/cm ²
	Workers	Dermal	Short-term exposure, Local effects	1.78 mg/cm ²
	Consumers	Inhalation	Long-term exposure, Systemic effects	0.77 mg/m ³
	Consumers	Inhalation	Short-term exposure, Systemic effects	3.08 mg/m ³
	Consumers	Inhalation	Long-term exposure, Local effects	0.77 mg/m ³
	Consumers	Inhalation	Short-term exposure, Local effects	3.08 mg/m ³
	Consumers	Dermal	Long-term exposure, Systemic effects	0.22 mg/kg bw/day
	Consumers	Dermal	Short-term exposure, Systemic effects	0.88 mg/kg bw/day
	Consumers	Dermal	Long-term exposure, Local effects	0.22 mg/cm ²
	Consumers	Dermal	Short-term exposure, Local effects	0.88 mg/cm ²
	Consumers	Oral	Long-term exposure, Systemic effects	0.22 mg/kg bw/day
	Consumers	Oral	Short-term exposure, Systemic effects	0.88 mg/kg bw/day

Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006:

Substance name	Environmental Compartment	Value
tributyl phosphate	Fresh water	0.082 mg/l
	Marine water	0.0082 mg/l
	Sewage treatment plant	1 mg/l
	Fresh water sediment	18.4 mg/kg dry weight (d.w.)

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	Marine sediment	1.84 mg/kg dry weight (d.w.)
	Soil	3.63 mg/kg dry weight (d.w.)

8.2 Exposure controls

Engineering measures

If user operations generate dust, fumes, gas, vapour or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Personal protective equipment

Eye protection	:	Tightly fitting safety goggles
Hand protection		
Material	:	Butyl rubber - IIR
Wearing time	:	< 60 min
Material	:	Viton®
Wearing time	:	< 60 min
Material	:	Polyvinyl chloride - PVC
Wearing time	:	< 60 min
Remarks	:	The suitability for a specific workplace should be discussed with the producers of the protective gloves. After contamination with product change the gloves immediately and dispose of them according to relevant national and local regulations
Skin and body protection	:	Impervious clothing Choose body protection according to the amount and concentration of the dangerous substance at the work place.
Respiratory protection	:	In the case of vapour formation use a respirator with an approved filter.
Filter type	:	Combined inorganic and acidic gas/vapour, ammonia/amines and organic vapour type (ABEK)

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance	:	liquid
Colour	:	colourless
Odour	:	odourless
Odour Threshold	:	No data available
pH	:	No data available

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Melting point/range	:	< -80 °C
Boiling point/boiling range	:	289 °C (1,013 hPa) 130 °C (5 hPa)
Flash point	:	152 °C Method: DIN EN 22719, closed cup
Evaporation rate	:	< 0.001 (Butyl Acetate=1.0)
Flammability (solid, gas)	:	No data available
Upper explosion limit	:	No data available
Lower explosion limit	:	No data available
Vapour pressure	:	< 0.0001 hPa (25 °C)
Relative vapour density	:	No data available
Relative density	:	No data available
Density	:	0.97 g/cm ³ (20 °C)
Solubility(ies) Water solubility	:	0.28 g/l
Partition coefficient: n-octanol/water	:	No data available
Ignition temperature	:	400 °C
Decomposition temperature	:	177 - 178 °C
Viscosity Viscosity, dynamic	:	3.5 - 4 mPa.s (20 °C)
Explosive properties	:	No data available
Oxidizing properties	:	No data available

9.2 Other information

Surface tension	:	25.1 - 27.55 mN/m, 20 °C
Molecular weight	:	266.36 g/mol
Self-ignition	:	> 482 °C

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Auto-ignition temperature

SECTION 10: Stability and reactivity

10.1 Reactivity

No dangerous reaction known under conditions of normal use.

10.2 Chemical stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

Hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.
No hazards to be specially mentioned.

10.4 Conditions to avoid

Conditions to avoid : No specific data.

10.5 Incompatible materials

Materials to avoid : No specific data.

10.6 Hazardous decomposition products

No hazardous decomposition products are known.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Harmful if swallowed.

Product:

Acute oral toxicity : Acute toxicity estimate: 1,557 mg/kg
Method: Calculation method

Components:

tributyl phosphate:

Acute oral toxicity : LD50 (Rat, male and female): 1,553 mg/kg

Acute toxicity estimate: 500 mg/kg
Method: Converted acute toxicity point estimate

Acute inhalation toxicity : LC50 (Rat, male and female): > 4242 mg/m³
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
Remarks: Highest producible concentration.

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Acute dermal toxicity : LD50 (Rabbit, male and female): > 3,100 mg/kg
Assessment: The substance or mixture has no acute dermal toxicity
Remarks: Dosage caused no mortality

Skin corrosion/irritation

Causes skin irritation.

Product:

Remarks: Mild skin irritation

Components:

tributyl phosphate:

Species: Rabbit
Method: OECD Test Guideline 404
Result: Irritating to skin.

Serious eye damage/eye irritation

Not classified based on available information.

Components:

tributyl phosphate:

Species: Rabbit
Method: OECD Test Guideline 405
Remarks: Mild eye irritation

Respiratory or skin sensitisation

Skin sensitisation

Not classified based on available information.

Respiratory sensitisation

Not classified based on available information.

Components:

tributyl phosphate:

Exposure routes: Skin contact
Species: Guinea pig
Result: Did not cause sensitisation on laboratory animals.
GLP: yes

Germ cell mutagenicity

Not classified based on available information.

Components:

tributyl phosphate:

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Genotoxicity in vitro : Test Type: Ames test
Test system: Bacteria
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Test Type: Chromosome aberration test in vitro
Test system: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative

Genotoxicity in vivo : Test Type: Chromosomal aberration assay
Species: Rat (male and female)
Cell type: Bone marrow
Application Route: Oral
Result: negative

Carcinogenicity

Suspected of causing cancer.

Components:

tributyl phosphate:

Species: Rat, (male)
Application Route: Oral
Exposure time: 24 month(s)
NOAEL: 8.9 mg/kg body weight
Method: OTS 798.3300 (Carcinogenicity)
Symptoms: No symptoms known or expected.

Species: Rat, (female)
Application Route: Oral
Exposure time: 24 month(s)
NOAEL: 11.6 mg/kg body weight
Method: OTS 798.3300 (Carcinogenicity)
Symptoms: No symptoms known or expected.

Remarks: The results of the mechanistic study confirm that TBP is not a genotoxic carcinogen. No evidence of a mutagenic potential was evident in all the genetic toxicity studies. It can be concluded that TBP via organ-specific cytotoxicity causes urinary bladder hyperplasia and necrosis. The indirect mechanism for cell transformation is supported by an increased mitotic activity and full reversal of the hyperplasia and proliferation after 10 weeks treatment followed by 10 weeks of recovery. These data support a low human risk from exposure to TBP.

Reproductive toxicity

Not classified based on available information.

Components:

tributyl phosphate:

Effects on foetal develop- : Species: Rat

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ment

Application Route: Oral
Duration of Single Treatment: 10 d
Teratogenicity: NOAEL: 750 mg/kg body weight
Embryo-foetal toxicity: NOAEL: 750 mg/kg body weight
Result: No adverse effects
GLP: yes

STOT - single exposure

Not classified based on available information.

STOT - repeated exposure

Not classified based on available information.

Repeated dose toxicity

Components:

tributyl phosphate:

Species: Mouse, male and female
NOAEL: 75 mg/kg
Application Route: Oral
Exposure time: 90 d
Number of exposures: daily
Method: OECD Test Guideline 408
GLP: yes
Remarks: Subchronic toxicity

Aspiration toxicity

Not classified based on available information.

Further information

Product:

Remarks: No data available

SECTION 12: Ecological information

12.1 Toxicity

Components:

tributyl phosphate:

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): 4.2 - 11.8 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 1.8 mg/l Exposure time: 48 h Remarks: Fresh water
Toxicity to algae	:	EbC50 (Desmodesmus subspicatus (green algae)): 1.3 mg/l End point: Biomass

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Exposure time: 96 h

ErC50 (Desmodesmus subspicatus (green algae)): 2.8 mg/l
End point: Growth rate
Exposure time: 72 h

EC10 (Desmodesmus subspicatus (green algae)): 0.92 mg/l
End point: Growth rate
Exposure time: 72 h

Toxicity to microorganisms : EC50 (activated sludge): 100 mg/l
Exposure time: 3 h
Method: OECD Test Guideline 209
Remarks: Fresh water

Toxicity to fish (Chronic toxicity) : NOEC: 0.82 mg/l
Exposure time: 95 d
Species: Oncorhynchus mykiss (rainbow trout)
Remarks: Fresh water

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: 1.3 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)
Remarks: Fresh water

12.2 Persistence and degradability

Components:

tributyl phosphate:

Biodegradability : Result: Readily biodegradable.
Biodegradation: 92 %
Exposure time: 28 d
Method: OECD Test Guideline 301D

Result: Readily biodegradable.
Biodegradation: 77 %
Exposure time: 28 d
Method: OECD Test Guideline 301C

12.3 Bioaccumulative potential

Components:

tributyl phosphate:

Bioaccumulation : Bioconcentration factor (BCF): 7 - 35

Partition coefficient: n-octanol/water : log Pow: 4
Method: calculated

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12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

Product:

Assessment : This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher..

12.6 Other adverse effects

Product:

Additional ecological information : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Toxic to aquatic life.
Harmful to aquatic life with long lasting effects.

The product does not contain heavy metals in concentrations of concern for waste water.
The product does not release nitrogen which can contribute to eutrophication.

SECTION 13: Disposal considerations

The information in this section contains generic advice and guidance. The list of Identified Uses in Annex should be consulted for any available use-specific information provided in the Exposure Scenario(s).

13.1 Waste treatment methods

Product : The generation of waste should be avoided or minimised wherever possible.
Where possible recycling is preferred to disposal or incineration.
The product should not be allowed to enter drains, water courses or the soil.
Do not contaminate ponds, waterways or ditches with chemical or used container.
Send to a licensed waste management company.
Waste disposal should be in accordance with existing federal state, provincial and or local environmental controls

Dispose of as hazardous waste in compliance with local and national regulations.

Contaminated packaging : Empty remaining contents.
Dispose of as unused product.
Do not re-use empty containers.

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SECTION 14: Transport information

14.1 UN number

Not regulated as a dangerous good

14.2 UN proper shipping name

Not regulated as a dangerous good

14.3 Transport hazard class(es)

Not regulated as a dangerous good

14.4 Packing group

Not regulated as a dangerous good

14.5 Environmental hazards

Not regulated as a dangerous good

14.6 Special precautions for user

Hazard statements : Not dangerous cargo.
Irritating to skin.
Keep separated from foodstuffs.

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

Not applicable for product as supplied.

SECTION 15: Regulatory information

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

International Chemical Weapons Convention (CWC) : Not applicable
Schedules of Toxic Chemicals and Precursors

REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59). : Not applicable

REACH - List of substances subject to authorisation (Annex XIV) : Not applicable

Regulation (EC) No 1005/2009 on substances that deplete the ozone layer : Not applicable

Regulation (EC) No 850/2004 on persistent organic pollutants : Not applicable

Council Regulation (EC) No 111/2005 laying down rules for the monitoring of trade between the Community and third countries in drug precursors. : Neither banned nor restricted

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.
Not applicable

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Other regulations:

Take note of Directive 92/85/EEC regarding maternity protection or stricter national regulations, where applicable.

Take note of Directive 94/33/EC on the protection of young people at work or stricter national regulations, where applicable.

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

H302	: Harmful if swallowed.
H315	: Causes skin irritation.
H351	: Suspected of causing cancer.
H412	: Harmful to aquatic life with long lasting effects.

Full text of other abbreviations

Acute Tox.	: Acute toxicity
Aquatic Chronic	: Long-term (chronic) aquatic hazard
Carc.	: Carcinogenicity
Skin Irrit.	: Skin irritation
GB EH40	: UK. EH40 WEL - Workplace Exposure Limits
GB EH40 / TWA	: Long-term exposure limit (8-hour TWA reference period)
GB EH40 / STEL	: Short-term exposure limit (15-minute reference period)

ATE = Acute Toxicity Estimate

BCF = Bioconcentration Factor

GHS = Globally Harmonized System of Classification and Labelling of Chemicals

Further information

The data given here is based on current knowledge and experience. The purpose of this Safety Data Sheet and its Annex [if required according to Regulation (EC) 1907/2006 (REACH)] is to describe the products in terms of their safety requirements. The given details do not imply any guarantee concerning the composition, properties or performance.

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Annex

Exposure Scenario (ES)

Number	Title
ES1	Formulation of hydraulic fluids, lubricants and greases, Industrial (ERC2; PROC5; PROC8b; PROC9; PC17; PC24) <u>Structured Short Title:</u> Formulation or re-packing; Various products (PC17, PC24).
ES2	Industrial use of hydraulic fluids, lubricants and greases (ERC7; PROC20; PC17; PC24) <u>Structured Short Title:</u> Use at industrial sites; Various products (PC17, PC24).
ES3	Servicing of hydraulic fluids in aircrafts and professional use of lubricants and greases in vehicles or machinery (ERC9a; ERC9b; PROC1; PROC2; PROC20; PC17; PC24) <u>Structured Short Title:</u> Widespread use by professional workers; Various products (PC17, PC24).
ES4	Formulation of antifoam agents, Industrial (ERC2; PROC5; PROC8b; PROC9; PC20) <u>Structured Short Title:</u> Formulation or re-packing; Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents (PC20).
ES5	Use of antifoam agent in concrete manufacture/use, Industrial (ERC5; PROC5; PROC8a; PROC8b; PROC19; PC20; SU13; SU19) <u>Structured Short Title:</u> Use at industrial sites; Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents (PC20); Various sectors (SU13, SU19).
ES6	Wide dispersive professional use of concrete antifoaming agent (ERC8c; PROC5; PROC8a; PROC8b; PROC9; PROC19; PC20; SU13; SU19) <u>Structured Short Title:</u> Widespread use by professional workers; Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents (PC20); Various sectors (SU13, SU19).
ES7	Use of antifoam agent in chemical synthesis, Industrial (ERC5; PROC5; PROC8b; PC20; SU8; SU9) <u>Structured Short Title:</u> Use at industrial sites; Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents (PC20); Various sectors (SU8, SU9).
ES8	Service life of articles containing antifoam agents, Consumer (ERC10b; PC20; SU19) <u>Structured Short Title:</u> Consumer use; Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents (PC20); Building and construction work (SU19).

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ES9	Extraction agents, Industrial (ERC4; PROC2; PROC8b; PC40; SU2a) <u>Structured Short Title:</u> Use at industrial sites; Extraction agents (PC40); Mining, (without offshore industries) (SU2a).
ES10	Formulation of pigments, Industrial (ERC2; PROC5; PROC8a; PROC9; PC9a) <u>Structured Short Title:</u> Formulation or re-packing; Coatings and paints, thinners, paint removers (PC9a).
ES11	Use of paints, Industrial (ERC5; PROC5; PROC7; PROC8a; PROC8b; PROC9; PC9a) <u>Structured Short Title:</u> Use at industrial sites; Coatings and paints, thinners, paint removers (PC9a).
ES12	Use of paints, Professional (ERC8c; ERC8f; PROC10; PROC11; PC9a) <u>Structured Short Title:</u> Widespread use by professional workers; Coatings and paints, thinners, paint removers (PC9a).
ES13	Use of paints, Consumer (ERC8c; ERC8f; PC9a) <u>Structured Short Title:</u> Consumer use; Coatings and paints, thinners, paint removers (PC9a).
ES14	Formulation of PUR coatings and adhesives, Industrial (ERC2; PROC5; PROC8b; PROC9; PC1; PC9a; PC32; SU12) <u>Structured Short Title:</u> Formulation or re-packing; Various products (PC1, PC9a, PC32); Manufacture of plastics products, including compounding and conversion (SU12).
ES15	PUR coatings and adhesives, Industrial (ERC5; PROC5; PROC6; PROC8a; PROC8b; PROC11; PROC14; PC1; PC9a; PC32; SU12; SU16; SU17; SU19) <u>Structured Short Title:</u> Use at industrial sites; Various products (PC1, PC9a, PC32); Various sectors (SU12, SU16, SU17, SU19).
ES16	PUR coatings and adhesives, Professional (ERC8c; ERC8f; PROC5; PROC8a; PROC8b; PROC10; PROC11; PROC13; PROC19; PC1; PC9a; PC32; SU12; SU13) <u>Structured Short Title:</u> Widespread use by professional workers; Various products (PC1, PC9a, PC32); Various sectors (SU12, SU13).
ES17	PUR coatings and adhesives, Consumer (ERC8c; ERC8f; PC1; PC9a; PC32) <u>Structured Short Title:</u> Consumer use; Various products (PC1, PC9a, PC32); Various sectors (SU12, SU13).
ES18	Service life of paints, coatings and adhesives, Consumer (ERC11b; ERC10b; PC1; PC9a; AC1; AC2; AC4; AC7; AC8; AC11; AC13)

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	<u>Structured Short Title:</u> Consumer use; Various products (PC1, PC9a); Various articles (AC1, AC2, AC4, AC7, AC8, AC11, AC13).
ES19	Use in laboratories, Professional (ERC6a; ERC6b; PROC15; PC21; SU24) <u>Structured Short Title:</u> Widespread use by professional workers; Laboratory chemicals (PC21); Scientific re-search and development (SU24).

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ES1: Formulation of hydraulic fluids, lubricants and greases, Industrial

1.1. Title section

Structured Short Title	: Formulation or re-packing; Various products (PC17, PC24).
Substance	: Tributyl phosphate EC-No.: 204-800-2 CAS-No.: 126-73-8

Environmental release category(ies)	: ERC2: Formulation into mixture
Process category(ies)	: PROC5: Mixing or blending in batch processes PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing)
Product (sub) category(ies)	: PC17: Hydraulic fluids PC24: Lubricants, greases, release products

Contributing Scenario (CS) Environment		
CS1	Formulation into mixture	ERC2

Contributing Scenario (CS) Worker		
CS2	General measures applicable to all activities	PROC0
CS3	Mixing or blending in batch processes	PROC5
CS4	Transfer of substance or mixture (charging/discharging) at dedicated facilities; Transfer of substance or mixture into small containers (dedicated filling line, including weighing)	PROC8b, PROC9

1.2. Conditions of use affecting exposure

1.2.1. Control of environmental exposure: Formulation into mixture (ERC2)

Remarks:

ERC only for communication purposes.

Product (article) characteristics	
Physical form of product	: Liquid
Vapour pressure	: 0.000346 Pa (25 °C)

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Amount used, frequency and duration of use (or from service life)

Maximum allowable site tonnage : Daily amount per site: 13,333 t
(MSafe)

Technical and organisational conditions and measures

Suitable technique(s) to limit releases to water:
Oil-water separation

Suitable technique(s) to limit releases to air:
Air-emission abatement such as scrubbers and filters should be used for waste gas.

Conditions and measures related to sewage treatment plant

STP type : Onsite Sewage Treatment Plant
Water - minimum efficiency of 89.1 %

STP sludge treatment : Recovery Methods

STP effluent : 2,000 m3/d

Conditions and measures related to treatment of waste (including article waste)

Waste treatment : oil from oil/water separators
This material and its container must be disposed of as hazardous.

Waste disposal methods : For general information on waste disposal see section 13.

Other conditions affecting environmental exposure

Receiving surface water flow : 18,000 m3/d

Local freshwater dilution factor : 10

Local marine water dilution factor : 100

1.2.2. Control of worker exposure: General measures applicable to all activities (PROC0)

Technical and organisational conditions and measures

The product is suspected of causing cancer.

Containment as appropriate.
Minimise number of staff exposed
Ensure segregation of worker from the source.

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Containment in place
Provide extract ventilation to points where emissions occur.
Good standard of general ventilation.
Avoid contact with contaminated tools and objects.
Consider technical advances and process upgrades (including automation) for the elimination of re-releases.
Regular cleaning of equipment and work area.
Only properly trained and authorised personnel shall handle the substance.
Substance-handling procedures shall be well documented and supervised.
Assumes a good basic standard of occupational hygiene is implemented

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

The product is suspected of causing cancer.

Wear suitable protective clothing.
Wear suitable gloves.
Wear suitable respiratory protection.
Use suitable eye protection.

For further specification, refer to section 8 of the SDS.

1.2.3. Control of worker exposure: Mixing or blending in batch processes (PROC5)

Product (article) characteristics

Concentration of substance in product	: Covers concentrations up to 60 %
Physical form of product	: Liquid
Vapour pressure	: 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)

Duration	: Covers exposure up to 8 h
Use frequency	: 220 days per year

Technical and organisational conditions and measures

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.
Only properly trained and authorised personnel shall handle the substance.

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Substance-handling procedures shall be well documented and strictly supervised.

Local exhaust ventilation
Inhalation - minimum efficiency of 90 %

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

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Dermal - minimum efficiency of 95 %

For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

Temperature : Covers use at ambient temperatures.

1.2.4. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities; Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC8b, PROC9)

Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 60 %

Physical form of product : Liquid

Vapour pressure : 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

Use frequency : 220 days per year

Technical and organisational conditions and measures

The product is suspected of causing cancer.
The product is skin irritant.

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Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Only properly trained and authorised personnel shall handle the substance.
Substance-handling procedures shall be well documented and strictly supervised.

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

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Dermal - minimum efficiency of 95 %

For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

Temperature : Covers use at ambient temperatures.

1.3. Exposure estimation and reference to its source

1.3.1. Environmental release and exposure: Formulation into mixture (ERC2)

Release route	Release	Release estimation method
Water, after RMM	0.107 %	Maximum load to waste water
Air, after on-site RMM	4.32 E-04 %	OECD ESD, No. 10 (OECD, 2004)
Soil, after on-site RMM	0 %	OECD ESD, No. 10 (OECD, 2004)

Compartment	Risk Characterisation Ratio (RCR)	Calculation method
All routes	< 1	ECETOC TRA

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1.3.3. Worker exposure: Mixing or blending in batch processes (PROC5)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	systemic	< 1	ECETOC TRA
All routes	-	carcinogenic effects		Qualitative assessment

Additional information on exposure estimation

The product is suspected of causing cancer.
The product is skin irritant.
Available hazard data do not enable the derivation of a DNEL for carcinogenic and dermal irritant effects.

1.3.4. Worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities; Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC8b, PROC9)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	systemic	< 1	ECETOC TRA
All routes	-	carcinogenic effects		Qualitative assessment

Additional information on exposure estimation

The product is suspected of causing cancer.
The product is skin irritant.
Available hazard data do not enable the derivation of a DNEL for carcinogenic and dermal irritant effects.

1.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance to Downstream Users

Fulfilling the above conditions the downstream user is deemed to work safely inside the boundaries set by this exposure scenario.
Other conditions should only be considered if the downstream user implements or recommends an

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exposure scenario which includes as a minimum the conditions described in this exposure scenario.

The product is suspected of causing cancer.

Therefore, exposure should be minimised by appropriate risk management measures.

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ES2: Industrial use of hydraulic fluids, lubricants and greases

2.1. Title section

Structured Short Title	: Use at industrial sites; Various products (PC17, PC24).
Substance	: Tributyl phosphate EC-No.: 204-800-2 CAS-No.: 126-73-8

Environmental release category(ies)	: ERC7: Use of functional fluid at industrial site
Process category(ies)	: PROC20: Use of functional fluids in small devices
Product (sub) category(ies)	: PC17: Hydraulic fluids PC24: Lubricants, greases, release products

Contributing Scenario (CS) Environment		
CS1	Use of functional fluid at industrial site	ERC7

Contributing Scenario (CS) Worker		
CS2	General measures applicable to all activities	PROC0
CS3	Use of functional fluids in small devices	PROC20

2.2. Conditions of use affecting exposure

2.2.1. Control of environmental exposure: Use of functional fluid at industrial site (ERC7)

Remarks:

ERC only for communication purposes.

Product (article) characteristics	
Physical form of product	: Liquid
Vapour pressure	: 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)	
Maximum allowable site tonnage (MSafe)	: Daily amount per site: 4.1 t

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Conditions and measures related to sewage treatment plant

STP type	:	Onsite Sewage Treatment Plant Water - minimum efficiency of 89.1 %
STP sludge treatment	:	Recovery Methods
STP effluent	:	2,000 m3/d

Conditions and measures related to treatment of waste (including article waste)

Waste disposal methods	:	For general information on waste disposal see section 13.
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Other conditions affecting environmental exposure

Receiving surface water flow	:	18,000 m3/d
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

2.2.2. Control of worker exposure: General measures applicable to all activities (PROC0)

Technical and organisational conditions and measures

The product is suspected of causing cancer.

Containment as appropriate.
Minimise number of staff exposed
Ensure segregation of worker from the source.
Containment in place
Provide extract ventilation to points where emissions occur.
Good standard of general ventilation.
Avoid contact with contaminated tools and objects.
Consider technical advances and process upgrades (including automation) for the elimination of re-leases.
Regular cleaning of equipment and work area.
Only properly trained and authorised personnel shall handle the substance.
Substance-handling procedures shall be well documented and supervised.
Assumes a good basic standard of occupational hygiene is implemented

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

The product is suspected of causing cancer.

Wear suitable protective clothing.
Wear suitable gloves.
Wear suitable respiratory protection.

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Use suitable eye protection.

For further specification, refer to section 8 of the SDS.

2.2.3. Control of worker exposure: Use of functional fluids in small devices (PROC20)

Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 100 %

Physical form of product : Liquid

Vapour pressure : 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

Use frequency : 220 days per year

Technical and organisational conditions and measures

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Only properly trained and authorised personnel shall handle the substance.
Substance-handling procedures shall be well documented and supervised.

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

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Dermal - minimum efficiency of 90 %

For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure

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Indoor or outdoor use	: Indoor use
Temperature	: Covers use at ambient temperatures.

2.3. Exposure estimation and reference to its source

2.3.1. Environmental release and exposure: Use of functional fluid at industrial site (ERC7)

Release route	Release	Release estimation method
Water	0.03 %	ESVOC SPERC 7.13a.v1
Air	0.01 E-04 %	ESVOC SPERC 7.13a.v1
Soil	0.1 %	ESVOC SPERC 7.13a.v1

Compartment	Risk Characterisation Ratio (RCR)	Calculation method
All routes	< 1	ECETOC TRA

2.3.3. Worker exposure: Use of functional fluids in small devices (PROC20)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	systemic	< 1	ECETOC TRA
All routes	-	carcinogenic effects		Qualitative assessment

Additional information on exposure estimation

The product is suspected of causing cancer.
The product is skin irritant.
Available hazard data do not enable the derivation of a DNEL for carcinogenic and dermal irritant effects.

2.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance to Downstream Users

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Fulfilling the above conditions the downstream user is deemed to work safely inside the boundaries set by this exposure scenario.

Other conditions should only be considered if the downstream user implements or recommends an exposure scenario which includes as a minimum the conditions described in this exposure scenario.

The product is suspected of causing cancer.

Therefore, exposure should be minimised by appropriate risk management measures.

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ES3: Servicing of hydraulic fluids in aircrafts and professional use of lubricants and greases in vehicles or machinery

3.1. Title section

Structured Short Title	: Widespread use by professional workers; Various products (PC17, PC24).
Substance	: Tributyl phosphate EC-No.: 204-800-2 CAS-No.: 126-73-8

Environmental release category(ies)	: ERC9a: Widespread use of functional fluid (indoor) ERC9b: Widespread use of functional fluid (outdoor)
Process category(ies)	: PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC20: Use of functional fluids in small devices
Product (sub) category(ies)	: PC17: Hydraulic fluids PC24: Lubricants, greases, release products

Contributing Scenario (CS) Environment

CS1	Widespread use of functional fluid (indoor); Widespread use of functional fluid (outdoor)	ERC9a, ERC9b
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Contributing Scenario (CS) Worker

CS2	Use of functional fluids in small devices	PROC20
CS3	General measures applicable to all activities	PROC0
CS4	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions	PROC1
CS5	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions	PROC2

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3.2. Conditions of use affecting exposure

3.2.1. Control of environmental exposure: Widespread use of functional fluid (indoor); Widespread use of functional fluid (outdoor) (ERC9a, ERC9b)

Product (article) characteristics	
Physical form of product	: Liquid
Vapour pressure	: 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)	
Annual amount for wide disperse uses	: 10000 t
Maximum allowable site tonnage (MSafe)	: Daily amount per site: 5.48 kg
Release type	: Continuous release
Emission days per year	: 365

Conditions and measures related to sewage treatment plant	
STP type	: Municipal Sewage Treatment Plant Water - minimum efficiency of 89.1 %
STP effluent	: 2,000 m3/d

Conditions and measures related to treatment of waste (including article waste)	
Waste treatment	: This material and its container must be disposed of as hazardous.
Waste disposal methods	: For general information on waste disposal see section 13.

Other conditions affecting environmental exposure	
Receiving surface water flow	: 18,000 m3/d
Local freshwater dilution factor	: 10
Local marine water dilution factor	: 100

3.2.2. Control of worker exposure: Use of functional fluids in small devices (PROC20)

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Product (article) characteristics	
Concentration of substance in product	: Covers concentrations up to 100 %
Physical form of product	: Liquid
Vapour pressure	: 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)	
Duration	: Covers exposure up to 8 h
Use frequency	: 220 days per year

Technical and organisational conditions and measures
The product is suspected of causing cancer. The product is skin irritant. Therefore, exposure should be minimised by appropriate risk management measures. For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.
Only properly trained and authorised personnel shall handle the substance. Substance-handling procedures shall be well documented and supervised.

Conditions and measures related to personal protection, hygiene and health evaluation
The product is suspected of causing cancer. The product is skin irritant. Therefore, exposure should be minimised by appropriate risk management measures. For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %
For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use
Temperature	: Covers use at ambient temperatures.

3.2.3. Control of worker exposure: General measures applicable to all activities (PROC0)

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Technical and organisational conditions and measures

The product is suspected of causing cancer.

Containment as appropriate.
Minimise number of staff exposed
Ensure segregation of worker from the source.
Containment in place
Provide extract ventilation to points where emissions occur.
Good standard of general ventilation.
Avoid contact with contaminated tools and objects.
Consider technical advances and process upgrades (including automation) for the elimination of re-leases.
Regular cleaning of equipment and work area.
Only properly trained and authorised personnel shall handle the substance.
Substance-handling procedures shall be well documented and supervised.
Assumes a good basic standard of occupational hygiene is implemented

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

The product is suspected of causing cancer.

Wear suitable protective clothing.
Wear suitable gloves.
Wear suitable respiratory protection.
Use suitable eye protection.

For further specification, refer to section 8 of the SDS.

3.2.4. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)

Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 100 %

Physical form of product : Liquid

Vapour pressure : 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

Use frequency : 220 days per year

Technical and organisational conditions and measures

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The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

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

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Other conditions affecting workers exposure

Indoor or outdoor use	: Covers indoor and outdoor use.
Temperature	: Covers use at ambient temperatures.

3.2.5. Control of worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Product (article) characteristics

Concentration of substance in product	: Covers concentrations up to 100 %
Physical form of product	: Liquid
Vapour pressure	: 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)

Duration	: Covers exposure up to 8 h
Use frequency	: 220 days per year

Technical and organisational conditions and measures

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to

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be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Only properly trained and authorised personnel shall handle the substance.
Substance-handling procedures shall be well documented and supervised.

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

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Dermal - minimum efficiency of 90 %

For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure

Indoor or outdoor use : Covers indoor and outdoor use.

Temperature : Covers use at ambient temperatures.

3.3. Exposure estimation and reference to its source

3.3.1. Environmental release and exposure: Widespread use of functional fluid (indoor); Widespread use of functional fluid (outdoor) (ERC9a, ERC9b)

Release route	Release	Release estimation method
Water	5 %	ERC9b
Air	5 E-04 %	ERC9b
Soil	5 %	ERC9b

Compartment	Risk Characterisation Ratio (RCR)	Calculation method
All routes	< 1	ECETOC TRA

3.3.2. Worker exposure: Use of functional fluids in small devices (PROC20)

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Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	systemic	< 1	ECETOC TRA
All routes	-	carcinogenic effects		Qualitative assessment

Additional information on exposure estimation

The product is suspected of causing cancer.
The product is skin irritant.
Available hazard data do not enable the derivation of a DNEL for carcinogenic and dermal irritant effects.

3.3.4. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	systemic	< 1	ECETOC TRA
All routes	-	carcinogenic effects		Qualitative assessment

Additional information on exposure estimation

The product is suspected of causing cancer.
The product is skin irritant.
Available hazard data do not enable the derivation of a DNEL for carcinogenic and dermal irritant effects.

3.3.5. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	systemic	< 1	ECETOC TRA
All routes	-	carcinogenic effects		Qualitative assessment

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Additional information on exposure estimation

The product is suspected of causing cancer.
The product is skin irritant.
Available hazard data do not enable the derivation of a DNEL for carcinogenic and dermal irritant effects.

3.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance to Downstream Users

Fulfilling the above conditions the downstream user is deemed to work safely inside the boundaries set by this exposure scenario.
Other conditions should only be considered if the downstream user implements or recommends an exposure scenario which includes as a minimum the conditions described in this exposure scenario.

The product is suspected of causing cancer.
Therefore, exposure should be minimised by appropriate risk management measures.

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ES4: Formulation of antifoam agents, Industrial

4.1. Title section

Structured Short Title	: Formulation or re-packing; Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents (PC20).
Environmental release category(ies)	: ERC2: Formulation into mixture
Process category(ies)	: PROC5: Mixing or blending in batch processes PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing)
Product (sub) category(ies)	: PC20: Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents

Contributing Scenario (CS) Environment		
CS1	Formulation into mixture	ERC2

Contributing Scenario (CS) Worker		
CS2	General measures applicable to all activities	PROC0
CS3	Mixing or blending in batch processes	PROC5
CS4	Transfer of substance or mixture (charging/discharging) at dedicated facilities	PROC8b
CS5	Transfer of substance or mixture into small containers (dedicated filling line, including weighing)	PROC9

4.2. Conditions of use affecting exposure

4.2.1. Control of environmental exposure: Formulation into mixture (ERC2)

Remarks:

ERC only for communication purposes.

Product (article) characteristics	
Physical form of product	: Liquid
Vapour pressure	: 0.000346 Pa (25 °C)

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Amount used, frequency and duration of use (or from service life)

Maximum allowable site tonnage : Daily amount per site: 4.167 t
(MSafe)

Conditions and measures related to sewage treatment plant

STP type : Onsite Sewage Treatment Plant
Water - minimum efficiency of 89.1 %

STP sludge treatment : Recovery Methods

STP effluent : 2,000 m3/d

Conditions and measures related to treatment of waste (including article waste)

Waste treatment : This material and its container must be disposed of as hazardous.

Waste disposal methods : For general information on waste disposal see section 13.

Other conditions affecting environmental exposure

Receiving surface water flow : 18,000 m3/d

Local freshwater dilution factor : 10

Local marine water dilution factor : 100

4.2.2. Control of worker exposure: General measures applicable to all activities (PROC0)

Technical and organisational conditions and measures

The product is suspected of causing cancer.

Containment as appropriate.

Minimise number of staff exposed

Ensure segregation of worker from the source.

Containment in place

Provide extract ventilation to points where emissions occur.

Good standard of general ventilation.

Avoid contact with contaminated tools and objects.

Consider technical advances and process upgrades (including automation) for the elimination of releases.

Regular cleaning of equipment and work area.

Only properly trained and authorised personnel shall handle the substance.

Substance-handling procedures shall be well documented and supervised.

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Assumes a good basic standard of occupational hygiene is implemented

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

The product is suspected of causing cancer.

Wear suitable protective clothing.
Wear suitable gloves.
Wear suitable respiratory protection.
Use suitable eye protection.

For further specification, refer to section 8 of the SDS.

4.2.3. Control of worker exposure: Mixing or blending in batch processes (PROC5)

Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 60 %

Physical form of product : Liquid

Vapour pressure : 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

Use frequency : 220 days per year

Technical and organisational conditions and measures

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Only properly trained and authorised personnel shall handle the substance.
Substance-handling procedures shall be well documented and strictly supervised.

Local exhaust ventilation
Inhalation - minimum efficiency of 90 %

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

The product is suspected of causing cancer.

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The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Dermal - minimum efficiency of 95 %

For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

Temperature : Covers use at ambient temperatures.

4.2.4. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)

Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 60 %

Physical form of product : Liquid

Vapour pressure : 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

Use frequency : 220 days per year

Technical and organisational conditions and measures

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Only properly trained and authorised personnel shall handle the substance.
Substance-handling procedures shall be well documented and strictly supervised.

Local exhaust ventilation
Inhalation - minimum efficiency of 97 %

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

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Dermal - minimum efficiency of 95 %

For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

Temperature : Covers use at ambient temperatures.

4.2.5. Control of worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 60 %

Physical form of product : Liquid

Vapour pressure : 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

Use frequency : 220 days per year

Technical and organisational conditions and measures

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Only properly trained and authorised personnel shall handle the substance.
Substance-handling procedures shall be well documented and strictly supervised.

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Local exhaust ventilation
Inhalation - minimum efficiency of 90 %

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

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Dermal - minimum efficiency of 95 %

For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

Temperature : Covers use at ambient temperatures.

4.3. Exposure estimation and reference to its source

4.3.1. Environmental release and exposure: Formulation into mixture (ERC2)

Release route	Release	Release estimation method
Water	0.2 %	ESVOC SPERC 2.2.v1
Air	0.25 %	ESVOC SPERC 2.2.v1
Soil	0.01 %	ESVOC SPERC 2.2.v1

Compartment	Risk Characterisation Ratio (RCR)	Calculation method
All routes	< 1	ECETOC TRA

4.3.3. Worker exposure: Mixing or blending in batch processes (PROC5)

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Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	systemic	< 1	ECETOC TRA
All routes	-	carcinogenic effects		Qualitative assessment

Additional information on exposure estimation

The product is suspected of causing cancer.
The product is skin irritant.
Available hazard data do not enable the derivation of a DNEL for carcinogenic and dermal irritant effects.

4.3.4. Worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	systemic	< 1	ECETOC TRA
All routes	-	carcinogenic effects		Qualitative assessment

Additional information on exposure estimation

The product is suspected of causing cancer.
The product is skin irritant.
Available hazard data do not enable the derivation of a DNEL for carcinogenic and dermal irritant effects.

4.3.5. Worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	systemic	< 1	ECETOC TRA
All routes	-	carcinogenic effects		Qualitative assessment

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Additional information on exposure estimation

The product is suspected of causing cancer.
The product is skin irritant.
Available hazard data do not enable the derivation of a DNEL for carcinogenic and dermal irritant effects.

4.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance to Downstream Users

Fulfilling the above conditions the downstream user is deemed to work safely inside the boundaries set by this exposure scenario.
Other conditions should only be considered if the downstream user implements or recommends an exposure scenario which includes as a minimum the conditions described in this exposure scenario.

The product is suspected of causing cancer.
Therefore, exposure should be minimised by appropriate risk management measures.

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ES5: Use of antifoam agent in concrete manufacture/use, Industrial

5.1. Title section

Structured Short Title	: Use at industrial sites; Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents (PC20); Various sectors (SU13, SU19).
Environmental release category(ies)	: ERC5: Use at industrial site leading to inclusion into/onto article
Process category(ies)	: PROC5: Mixing or blending in batch processes PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities PROC19: Manual activities involving hand contact
Product (sub) category(ies)	: PC20: Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents
Sector(s) of use	: SU13: Manufacture of other non-metallic mineral products, e.g. plasters, cement SU19: Building and construction work

Contributing Scenario (CS) Environment

CS1	Use at industrial site leading to inclusion into/onto article	ERC5
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Contributing Scenario (CS) Worker

CS2	General measures applicable to all activities	PROC0
CS3	Mixing or blending in batch processes; Transfer of substance or mixture (charging/discharging) at non dedicated-facilities; Transfer of substance or mixture (charging/discharging) at dedicated facilities	PROC5, PROC8a, PROC8b
CS4	Manual activities involving hand contact	PROC19

5.2. Conditions of use affecting exposure

5.2.1. Control of environmental exposure: Use at industrial site leading to inclusion into/onto article (ERC5)

Remarks:

ERC only for communication purposes.

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Product (article) characteristics

Physical form of product	: Liquid
Vapour pressure	: 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)

Maximum allowable site tonnage (MSafe)	: Daily amount per site: 1.775 t
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Conditions and measures related to sewage treatment plant

STP type	: Onsite Sewage Treatment Plant Water - minimum efficiency of 89.1 %
STP sludge treatment	: Recovery Methods
STP effluent	: 2,000 m3/d

Conditions and measures related to treatment of waste (including article waste)

Waste treatment	: This material and its container must be disposed of as hazardous.
Waste disposal methods	: For general information on waste disposal see section 13.

Other conditions affecting environmental exposure

Receiving surface water flow	: 18,000 m3/d
Local freshwater dilution factor	: 10
Local marine water dilution factor	: 100

5.2.2. Control of worker exposure: General measures applicable to all activities (PROC0)

Technical and organisational conditions and measures

The product is suspected of causing cancer.

Containment as appropriate.
Minimise number of staff exposed
Ensure segregation of worker from the source.
Containment in place
Provide extract ventilation to points where emissions occur.
Good standard of general ventilation.
Avoid contact with contaminated tools and objects.

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Consider technical advances and process upgrades (including automation) for the elimination of releases.

Regular cleaning of equipment and work area.

Only properly trained and authorised personnel shall handle the substance.

Substance-handling procedures shall be well documented and supervised.

Assumes a good basic standard of occupational hygiene is implemented

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

The product is suspected of causing cancer.

Wear suitable protective clothing.

Wear suitable gloves.

Wear suitable respiratory protection.

Use suitable eye protection.

For further specification, refer to section 8 of the SDS.

5.2.3. Control of worker exposure: Mixing or blending in batch processes; Transfer of substance or mixture (charging/discharging) at non dedicated-facilities; Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC5, PROC8a, PROC8b)

Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 3 %

Physical form of product : Liquid

Vapour pressure : 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

Use frequency : 220 days per year

Technical and organisational conditions and measures

The product is suspected of causing cancer.

The product is skin irritant.

Therefore, exposure should be minimised by appropriate risk management measures.

For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Local exhaust ventilation

Inhalation - minimum efficiency of 90 %

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

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Other conditions affecting workers exposure

Indoor or outdoor use	:	Indoor use
Temperature	:	Covers use at ambient temperatures.

5.2.4. Control of worker exposure: Manual activities involving hand contact (PROC19)

Product (article) characteristics

Concentration of substance in product	:	Covers concentrations up to 3 %
Physical form of product	:	Liquid
Vapour pressure	:	0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)

Duration	:	Covers exposure up to 8 h
Use frequency	:	220 days per year

Technical and organisational conditions and measures

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Only properly trained and authorised personnel shall handle the substance.
Substance-handling procedures shall be well documented and supervised.

Local exhaust ventilation
Inhalation - minimum efficiency of 90 %

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

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Dermal - minimum efficiency of 90 %

For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

Temperature : Covers use at ambient temperatures.

5.3. Exposure estimation and reference to its source

5.3.1. Environmental release and exposure: Use at industrial site leading to inclusion into/onto article (ERC5)

Release route	Release	Release estimation method
Water	0.25 %	EFCC SPERC 5.1a.v1
Air	1.7 %	EFCC SPERC 5.1a.v1
Soil	0 %	EFCC SPERC 5.1a.v1

Compartment	Risk Characterisation Ratio (RCR)	Calculation method
All routes	< 1	ECETOC TRA

5.3.3. Worker exposure: Mixing or blending in batch processes; Transfer of substance or mixture (charging/discharging) at non dedicated-facilities; Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC5, PROC8a, PROC8b)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
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combined routes	-	systemic	< 1	ECETOC TRA
All routes	-	carcinogenic effects		Qualitative assessment

Additional information on exposure estimation

The product is suspected of causing cancer.
The product is skin irritant.
Available hazard data do not enable the derivation of a DNEL for carcinogenic and dermal irritant effects.

5.3.4. Worker exposure: Manual activities involving hand contact (PROC19)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	systemic	< 1	ECETOC TRA
All routes	-	carcinogenic effects		Qualitative assessment

Additional information on exposure estimation

The product is suspected of causing cancer.
The product is skin irritant.
Available hazard data do not enable the derivation of a DNEL for carcinogenic and dermal irritant effects.

5.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance to Downstream Users

Fulfilling the above conditions the downstream user is deemed to work safely inside the boundaries set by this exposure scenario.
Other conditions should only be considered if the downstream user implements or recommends an exposure scenario which includes as a minimum the conditions described in this exposure scenario.

The product is suspected of causing cancer.
Therefore, exposure should be minimised by appropriate risk management measures.

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ES6: Wide dispersive professional use of concrete antifoaming agent

6.1. Title section

Structured Short Title	: Widespread use by professional workers; Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents (PC20); Various sectors (SU13, SU19).
Environmental release category(ies)	: ERC8c : Widespread use leading to inclusion into/onto article (indoor)
Process category(ies)	: PROC5 : Mixing or blending in batch processes PROC8a : Transfer of substance or mixture (charging/discharging) at non dedicated-facilities PROC8b : Transfer of substance or mixture (charging/discharging) at dedicated facilities PROC9 : Transfer of substance or mixture into small containers (dedicated filling line, including weighing) PROC19 : Manual activities involving hand contact
Product (sub) category(ies)	: PC20 : Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents
Sector(s) of use	: SU13 : Manufacture of other non-metallic mineral products, e.g. plasters, cement SU19 : Building and construction work

Contributing Scenario (CS) Environment

CS1	Widespread use leading to inclusion into/onto article (indoor)	ERC8c
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Contributing Scenario (CS) Worker

CS2	General measures applicable to all activities	PROC0
CS3	Mixing or blending in batch processes; Transfer of substance or mixture (charging/discharging) at non dedicated-facilities; Transfer of substance or mixture (charging/discharging) at dedicated facilities; Transfer of substance or mixture into small containers (dedicated filling line, including weighing)	PROC5, PROC8a, PROC8b, PROC9
CS4	Manual activities involving hand contact	PROC19

6.2. Conditions of use affecting exposure

6.2.1. Control of environmental exposure: Widespread use leading to inclusion into/onto article (indoor) (ERC8c)

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Product (article) characteristics	
Physical form of product	: Liquid
Vapour pressure	: 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)	
Annual amount for wide disperse uses	: 1200 t
Maximum allowable site tonnage (MSafe)	: Daily amount per site: 0.658 kg
Release type	: Continuous release
Emission days per year	: 365

Conditions and measures related to sewage treatment plant	
STP type	: Municipal Sewage Treatment Plant Water - minimum efficiency of 89.1 %
STP effluent	: 2,000 m3/d

Conditions and measures related to treatment of waste (including article waste)	
Waste disposal methods	: For general information on waste disposal see section 13.

Other conditions affecting environmental exposure	
Receiving surface water flow	: 18,000 m3/d
Local freshwater dilution factor	: 10
Local marine water dilution factor	: 100

6.2.2. Control of worker exposure: General measures applicable to all activities (PROC0)

Technical and organisational conditions and measures
The product is suspected of causing cancer.
Containment as appropriate. Minimise number of staff exposed Ensure segregation of worker from the source. Containment in place Provide extract ventilation to points where emissions occur.

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Good standard of general ventilation.
Avoid contact with contaminated tools and objects.
Consider technical advances and process upgrades (including automation) for the elimination of re-leases.
Regular cleaning of equipment and work area.
Only properly trained and authorised personnel shall handle the substance.
Substance-handling procedures shall be well documented and supervised.
Assumes a good basic standard of occupational hygiene is implemented

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

The product is suspected of causing cancer.

Wear suitable protective clothing.
Wear suitable gloves.
Wear suitable respiratory protection.
Use suitable eye protection.

For further specification, refer to section 8 of the SDS.

6.2.3. Control of worker exposure: Mixing or blending in batch processes; Transfer of substance or mixture (charging/discharging) at non dedicated-facilities; Transfer of substance or mixture (charging/discharging) at dedicated facilities; Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC5, PROC8a, PROC8b, PROC9)

Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 3 %

Physical form of product : Liquid

Vapour pressure : 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

Use frequency : 220 days per year

Technical and organisational conditions and measures

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

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

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Other conditions affecting workers exposure

Indoor or outdoor use	: Indoor use
Temperature	: Covers use at ambient temperatures.

6.2.4. Control of worker exposure: Manual activities involving hand contact (PROC19)

Product (article) characteristics

Concentration of substance in product	: Covers concentrations up to 3 %
Physical form of product	: Liquid
Vapour pressure	: 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)

Duration	: Covers exposure up to 8 h
Use frequency	: 220 days per year

Technical and organisational conditions and measures

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Only properly trained and authorised personnel shall handle the substance.
Substance-handling procedures shall be well documented and supervised.

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

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The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Dermal - minimum efficiency of 90 %

For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

Temperature : Covers use at ambient temperatures.

6.3. Exposure estimation and reference to its source

6.3.1. Environmental release and exposure: Widespread use leading to inclusion into/onto article (indoor) (ERC8c)

Release route	Release	Release estimation method
Water	1 %	ERC based
Air	15 %	ERC based
Soil	0 %	ERC based

Compartment	Risk Characterisation Ratio (RCR)	Calculation method
All routes	< 1	ECETOC TRA

6.3.3. Worker exposure: Mixing or blending in batch processes; Transfer of substance or mixture (charging/discharging) at non dedicated-facilities; Transfer of substance or mixture (charging/discharging) at dedicated facilities; Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC5, PROC8a, PROC8b, PROC9)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	systemic	< 1	ECETOC TRA

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All routes	-	carcinogenic effects		Qualitative assessment
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Additional information on exposure estimation

The product is suspected of causing cancer.
The product is skin irritant.
Available hazard data do not enable the derivation of a DNEL for carcinogenic and dermal irritant effects.

6.3.4. Worker exposure: Manual activities involving hand contact (PROC19)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	systemic	< 1	ECETOC TRA
All routes	-	carcinogenic effects		Qualitative assessment

Additional information on exposure estimation

The product is suspected of causing cancer.
The product is skin irritant.
Available hazard data do not enable the derivation of a DNEL for carcinogenic and dermal irritant effects.

6.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance to Downstream Users

Fulfilling the above conditions the downstream user is deemed to work safely inside the boundaries set by this exposure scenario.
Other conditions should only be considered if the downstream user implements or recommends an exposure scenario which includes as a minimum the conditions described in this exposure scenario.

The product is suspected of causing cancer.
Therefore, exposure should be minimised by appropriate risk management measures.

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ES7: Use of antifoam agent in chemical synthesis, Industrial

7.1. Title section

Structured Short Title	: Use at industrial sites; Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents (PC20); Various sectors (SU8, SU9).
Environmental release category(ies)	: ERC5: Use at industrial site leading to inclusion into/onto article
Process category(ies)	: PROC5: Mixing or blending in batch processes PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities
Product (sub) category(ies)	: PC20: Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents
Sector(s) of use	: SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals

Contributing Scenario (CS) Environment

CS1	Use at industrial site leading to inclusion into/onto article	ERC5
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Contributing Scenario (CS) Worker

CS2	General measures applicable to all activities	PROC0
CS3	Mixing or blending in batch processes; Transfer of substance or mixture (charging/discharging) at dedicated facilities	PROC5, PROC8b

7.2. Conditions of use affecting exposure

7.2.1. Control of environmental exposure: Use at industrial site leading to inclusion into/onto article (ERC5)

Product (article) characteristics	
Physical form of product	: Liquid
Vapour pressure	: 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)

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Maximum allowable site tonnage (MSafe)	: Daily amount per site: 244 kg
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Technical and organisational conditions and measures

Process with efficient use of raw materials.

Conditions and measures related to sewage treatment plant

STP type	: Onsite Sewage Treatment Plant Water - minimum efficiency of 89.1 %
STP sludge treatment	: Recovery Methods
STP effluent	: 2,000 m3/d

Conditions and measures related to treatment of waste (including article waste)

Waste disposal methods	: For general information on waste disposal see section 13.
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Other conditions affecting environmental exposure

Receiving surface water flow	: 18,000 m3/d
Local freshwater dilution factor	: 10
Local marine water dilution factor	: 100

7.2.2. Control of worker exposure: General measures applicable to all activities (PROC0)

Technical and organisational conditions and measures

The product is suspected of causing cancer.

Containment as appropriate.
Minimise number of staff exposed
Ensure segregation of worker from the source.
Containment in place
Provide extract ventilation to points where emissions occur.
Good standard of general ventilation.
Avoid contact with contaminated tools and objects.
Consider technical advances and process upgrades (including automation) for the elimination of re-leases.
Regular cleaning of equipment and work area.
Only properly trained and authorised personnel shall handle the substance.
Substance-handling procedures shall be well documented and supervised.
Assumes a good basic standard of occupational hygiene is implemented

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

The product is suspected of causing cancer.

Wear suitable protective clothing.
Wear suitable gloves.
Wear suitable respiratory protection.
Use suitable eye protection.

For further specification, refer to section 8 of the SDS.

7.2.3. Control of worker exposure: Mixing or blending in batch processes; Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC5, PROC8b)

Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 10 %

Physical form of product : Liquid

Vapour pressure : 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

Use frequency : 220 days per year

Technical and organisational conditions and measures

The product is suspected of causing cancer.

The product is skin irritant.

Therefore, exposure should be minimised by appropriate risk management measures.

For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Only properly trained and authorised personnel shall handle the substance.

Substance-handling procedures shall be well documented and supervised.

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

The product is suspected of causing cancer.

The product is skin irritant.

Therefore, exposure should be minimised by appropriate risk management measures.

For general risk management measures, operational conditions and personal protective equipment to

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be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Dermal - minimum efficiency of 90 %

For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

Temperature : Covers use at ambient temperatures.

7.3. Exposure estimation and reference to its source

7.3.1. Environmental release and exposure: Use at industrial site leading to inclusion into/onto article (ERC5)

Release route	Release	Release estimation method
Water, before on-site RMM	6 %	ERC1
Air, before on-site RMM	5 %	ERC1
Soil, before on-site RMM	0.01 %	ERC1

Compartment	Risk Characterisation Ratio (RCR)	Calculation method
All routes	< 1	ECETOC TRA

7.3.3. Worker exposure: Mixing or blending in batch processes; Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC5, PROC8b)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	systemic	< 1	ECETOC TRA
All routes	-	carcinogenic effects		Qualitative assessment

Additional information on exposure estimation

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The product is suspected of causing cancer.
The product is skin irritant.
Available hazard data do not enable the derivation of a DNEL for carcinogenic and dermal irritant effects.

7.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance to Downstream Users

Fulfilling the above conditions the downstream user is deemed to work safely inside the boundaries set by this exposure scenario.
Other conditions should only be considered if the downstream user implements or recommends an exposure scenario which includes as a minimum the conditions described in this exposure scenario.

The product is suspected of causing cancer.
Therefore, exposure should be minimised by appropriate risk management measures.

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ES8: Service life of articles containing antifoam agents, Consumer

8.1. Title section

Structured Short Title	:	Consumer use; Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents (PC20); Building and construction work (SU19).
Environmental release category(ies)	:	ERC10b: Widespread use of articles with high or intended release (outdoor)
Product (sub) category(ies)	:	PC20: Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents
Sector(s) of use	:	SU19: Building and construction work
Contributing Scenario (CS) Environment		
CS1	Widespread use of articles with high or intended release (outdoor)	ERC10b
Contributing Scenario (CS) Consumer		
CS2	Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents	PC20

8.2. Conditions of use affecting exposure

8.2.1. Control of environmental exposure: Widespread use of articles with high or intended release (outdoor) (ERC10b)

Product (article) characteristics	
Physical form of product	: Liquid
Vapour pressure	: 0.000346 Pa (25 °C)
Amount used, frequency and duration of use (or from service life)	
Annual amount for wide disperse uses	: 10000 t
Maximum allowable site tonnage (MSafe)	: 1.096 kgDaily amount per site:

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Release type	: Continuous release
Emission days per year	: 365

Conditions and measures related to sewage treatment plant

STP type	: Municipal Sewage Treatment Plant Water - minimum efficiency of 89.1 %
STP effluent	: 2,000 m3/d

Conditions and measures related to treatment of waste (including article waste)

Waste treatment	: This material and its container must be disposed of as hazardous.
Waste disposal methods	: For general information on waste disposal see section 13.

Other conditions affecting environmental exposure

Receiving surface water flow	: 18,000 m3/d
Local freshwater dilution factor	: 10
Local marine water dilution factor	: 100

8.2.2. Control of consumer exposure: Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents (PC20)

Product (article) characteristics

Concentration of substance in product	: Covers concentrations up to 3 %
Physical form of product	: Liquid
Vapour pressure	: 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)

Use frequency	: 365 days per year
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Conditions and measures related to personal protection, hygiene and health evaluation

Avoid using without gloves.

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Other conditions affecting consumers exposure

Indoor or outdoor use : Outdoor use
Temperature : Covers use at ambient temperatures.

8.3. Exposure estimation and reference to its source

8.3.1. Environmental release and exposure: Widespread use of articles with high or intended release (outdoor) (ERC10b)

Release route	Release	Release estimation method
Water	100 %	ERC based
Air	100 E-04 %	ERC based
Soil	100 %	ERC based

Compartment	Risk Characterisation Ratio (RCR)	Calculation method
All routes	< 1	ECETOC TRA

8.3.2. Consumer exposure: Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents (PC20)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
All routes	-	-		Qualitative assessment

Additional information on exposure estimation

Oral exposure is considered to be not relevant.

8.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance to Downstream Users

Not applicable

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ES9: Extraction agents, Industrial

9.1. Title section

Structured Short Title	: Use at industrial sites; Extraction agents (PC40); Mining, (without offshore industries) (SU2a).
Environmental release category(ies)	: ERC4: Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
Process category(ies)	: PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities
Product (sub) category(ies)	: PC40: Extraction agents
Sector(s) of use	: SU2a: Mining, (without offshore industries)

Contributing Scenario (CS) Environment		
CS1	Use of non-reactive processing aid at industrial site (no inclusion into or onto article)	ERC4

Contributing Scenario (CS) Worker		
CS2	General measures applicable to all activities	PROC0
CS3	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions	PROC2
CS4	Transfer of substance or mixture (charging/discharging) at dedicated facilities	PROC8b

9.2. Conditions of use affecting exposure

9.2.1. Control of environmental exposure: Use of non-reactive processing aid at industrial site (no inclusion into or onto article) (ERC4)

Remarks:

ERC only for communication purposes.

Product (article) characteristics	
Physical form of product	: Liquid

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Vapour pressure	: 0.000346 Pa (25 °C)
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Amount used, frequency and duration of use (or from service life)

Annual amount used in the EU	: 600 t
Maximum allowable site tonnage (MSafe)	: Daily amount per site: 6 t
Emission days per year	: 100

Technical and organisational conditions and measures

Suitable technique(s) to limit releases to soil:
Floor should be impervious and resistant to liquid.

Conditions and measures related to sewage treatment plant

STP type	: Municipal Sewage Treatment Plant Water - minimum efficiency of 89.1 %
STP sludge treatment	: Recovery Methods
STP effluent	: 2,000 m3/d

Conditions and measures related to treatment of waste (including article waste)

Waste disposal methods	: For general information on waste disposal see section 13.
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Other conditions affecting environmental exposure

Receiving surface water flow	: 18,000 m3/d
Local freshwater dilution factor	: 10
Local marine water dilution factor	: 100

9.2.2. Control of worker exposure: General measures applicable to all activities (PROC0)

Technical and organisational conditions and measures

The product is suspected of causing cancer.

Containment as appropriate.
Minimise number of staff exposed
Ensure segregation of worker from the source.
Containment in place

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Provide extract ventilation to points where emissions occur.
Good standard of general ventilation.
Avoid contact with contaminated tools and objects.
Consider technical advances and process upgrades (including automation) for the elimination of re-leases.
Regular cleaning of equipment and work area.
Only properly trained and authorised personnel shall handle the substance.
Substance-handling procedures shall be well documented and supervised.
Assumes a good basic standard of occupational hygiene is implemented

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

The product is suspected of causing cancer.

Wear suitable protective clothing.
Wear suitable gloves.
Wear suitable respiratory protection.
Use suitable eye protection.

For further specification, refer to section 8 of the SDS.

9.2.3. Control of worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 100 %

Physical form of product : Liquid

Vapour pressure : 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

Use frequency : 220 days per year

Technical and organisational conditions and measures

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

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Only properly trained and authorised personnel shall handle the substance.
Substance-handling procedures shall be well documented and supervised.

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

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Dermal - minimum efficiency of 90 %

For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure

Indoor or outdoor use : Covers indoor and outdoor use.

Temperature : Covers use at ambient temperatures.

9.2.4. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)

Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 100 %

Physical form of product : Liquid

Vapour pressure : 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

Use frequency : 220 days per year

Technical and organisational conditions and measures

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to

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all activities' section in this exposure scenario.

Only properly trained and authorised personnel shall handle the substance.
Substance-handling procedures shall be well documented and strictly supervised.

Local exhaust ventilation
Inhalation - minimum efficiency of 97 %

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

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Dermal - minimum efficiency of 95 %

For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure

Indoor or outdoor use : Covers indoor and outdoor use.

Temperature : Covers use at ambient temperatures.

9.3. Exposure estimation and reference to its source

9.3.1. Environmental release and exposure: Use of non-reactive processing aid at industrial site (no inclusion into or onto article) (ERC4)

Release route	Release	Release estimation method
Water, after RMM	0.02 %	ESVOC SPERC 4.20.v1
Air, after on-site RMM	0.2 %	ESVOC SPERC 4.20.v1
Soil, after on-site RMM	0.01 %	ESVOC SPERC 4.20.v1

Compartment	Risk Characterisation Ratio (RCR)	Calculation method
All routes	< 1	ECETOC TRA

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9.3.3. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	systemic	< 1	ECETOC TRA
All routes	-	carcinogenic effects		Qualitative assessment

Additional information on exposure estimation

The product is suspected of causing cancer.
The product is skin irritant.
Available hazard data do not enable the derivation of a DNEL for carcinogenic and dermal irritant effects.

9.3.4. Worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	systemic	< 1	ECETOC TRA
All routes	-	carcinogenic effects		Qualitative assessment

Additional information on exposure estimation

The product is suspected of causing cancer.
The product is skin irritant.
Available hazard data do not enable the derivation of a DNEL for carcinogenic and dermal irritant effects.

9.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance to Downstream Users

Fulfilling the above conditions the downstream user is deemed to work safely inside the boundaries set by this exposure scenario.
Other conditions should only be considered if the downstream user implements or recommends an

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exposure scenario which includes as a minimum the conditions described in this exposure scenario.

The product is suspected of causing cancer.

Therefore, exposure should be minimised by appropriate risk management measures.

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ES10: Formulation of pigments, Industrial

10.1. Title section

Structured Short Title	: Formulation or re-packing; Coatings and paints, thinners, paint removers (PC9a).
Environmental release category(ies)	: ERC2: Formulation into mixture
Process category(ies)	: PROC5: Mixing or blending in batch processes PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing)
Product (sub) category(ies)	: PC9a: Coatings and paints, thinners, paint removers

Contributing Scenario (CS) Environment		
CS1	Formulation into mixture	ERC2

Contributing Scenario (CS) Worker		
CS2	General measures applicable to all activities	PROC0
CS3	Mixing or blending in batch processes; Transfer of substance or mixture (charging/discharging) at non dedicated-facilities; Transfer of substance or mixture into small containers (dedicated filling line, including weighing)	PROC5, PROC8a, PROC9

10.2. Conditions of use affecting exposure

10.2.1. Control of environmental exposure: Formulation into mixture (ERC2)

Product (article) characteristics	
Physical form of product	: Liquid
Vapour pressure	: 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)	
Maximum allowable site tonnage (MSafe)	: Daily amount per site: 729 kg

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Conditions and measures related to sewage treatment plant

STP type	:	Municipal Sewage Treatment Plant Water - minimum efficiency of 89.1 %
STP sludge treatment	:	Recovery Methods
STP effluent	:	2,000 m3/d

Conditions and measures related to treatment of waste (including article waste)

Waste treatment	:	Incineration
Waste disposal methods	:	For general information on waste disposal see section 13.

Other conditions affecting environmental exposure

Receiving surface water flow	:	18,000 m3/d
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

10.2.2. Control of worker exposure: General measures applicable to all activities (PROC0)

Technical and organisational conditions and measures

The product is suspected of causing cancer.

Containment as appropriate.
Minimise number of staff exposed
Ensure segregation of worker from the source.
Containment in place
Provide extract ventilation to points where emissions occur.
Good standard of general ventilation.
Avoid contact with contaminated tools and objects.
Consider technical advances and process upgrades (including automation) for the elimination of re-releases.
Regular cleaning of equipment and work area.
Only properly trained and authorised personnel shall handle the substance.
Substance-handling procedures shall be well documented and supervised.
Assumes a good basic standard of occupational hygiene is implemented

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

The product is suspected of causing cancer.

Wear suitable protective clothing.

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Wear suitable gloves.
Wear suitable respiratory protection.
Use suitable eye protection.

For further specification, refer to section 8 of the SDS.

10.2.3. Control of worker exposure: Mixing or blending in batch processes; Transfer of substance or mixture (charging/discharging) at non dedicated-facilities; Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC5, PROC8a, PROC9)

Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 10 %

Physical form of product : Liquid

Vapour pressure : 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

Use frequency : 220 days per year

Technical and organisational conditions and measures

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Only properly trained and authorised personnel shall handle the substance.
Substance-handling procedures shall be well documented and supervised.

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

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Dermal - minimum efficiency of 90 %

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For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use
Temperature : Covers use at ambient temperatures.

10.3. Exposure estimation and reference to its source

10.3.1. Environmental release and exposure: Formulation into mixture (ERC2)

Release route	Release	Release estimation method
Water	2 %	ERC based
Air	2.5 %	ERC based
Soil	0.01 %	ERC based

Compartment	Risk Characterisation Ratio (RCR)	Calculation method
All routes	< 1	ECETOC TRA

10.3.3. Worker exposure: Mixing or blending in batch processes; Transfer of substance or mixture (charging/discharging) at non dedicated-facilities; Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC5, PROC8a, PROC9)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	systemic	< 1	ECETOC TRA
All routes	-	carcinogenic effects		Qualitative assessment

Additional information on exposure estimation

The product is suspected of causing cancer.
The product is skin irritant.
Available hazard data do not enable the derivation of a DNEL for carcinogenic and dermal irritant effects.

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10.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance to Downstream Users
Fulfilling the above conditions the downstream user is deemed to work safely inside the boundaries set by this exposure scenario. Other conditions should only be considered if the downstream user implements or recommends an exposure scenario which includes as a minimum the conditions described in this exposure scenario.
The product is suspected of causing cancer. Therefore, exposure should be minimised by appropriate risk management measures.

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ES11: Use of paints, Industrial

11.1. Title section

Structured Short Title	: Use at industrial sites; Coatings and paints, thinners, paint removers (PC9a).
Environmental release category(ies)	: ERC5: Use at industrial site leading to inclusion into/onto article
Process category(ies)	: PROC5: Mixing or blending in batch processes PROC7: Industrial spraying PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing)
Product (sub) category(ies)	: PC9a: Coatings and paints, thinners, paint removers

Contributing Scenario (CS) Environment		
CS1	Use at industrial site leading to inclusion into/onto article	ERC5

Contributing Scenario (CS) Worker		
CS2	General measures applicable to all activities	PROC0
CS3	Mixing or blending in batch processes; Transfer of substance or mixture (charging/discharging) at non dedicated-facilities; Transfer of substance or mixture (charging/discharging) at dedicated facilities	PROC5, PROC8a, PROC8b
CS4	Industrial spraying	PROC7
CS5	Transfer of substance or mixture into small containers (dedicated filling line, including weighing)	PROC9

11.2. Conditions of use affecting exposure

11.2.1. Control of environmental exposure: Use at industrial site leading to inclusion into/onto article (ERC5)

Product (article) characteristics	
Physical form of product	: Liquid

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Vapour pressure	: 0.000346 Pa (25 °C)
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Amount used, frequency and duration of use (or from service life)

Maximum allowable site tonnage (MSafe)	: Daily amount per site: 769 kg
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Technical and organisational conditions and measures

Suitable technique(s) to limit releases to air:
Air-emission abatement such as scrubbers and filters should be used for waste gas.
Air - minimum efficiency of 95 %

Conditions and measures related to sewage treatment plant

STP type	: Municipal Sewage Treatment Plant Water - minimum efficiency of 89.1 %
STP sludge treatment	: Recovery Methods
STP effluent	: 2,000 m3/d

Conditions and measures related to treatment of waste (including article waste)

Waste treatment	: Incineration, disposal or recycling at specific offsite provider
Waste disposal methods	: For general information on waste disposal see section 13.

Other conditions affecting environmental exposure

Receiving surface water flow	: 18,000 m3/d
Local freshwater dilution factor	: 10
Local marine water dilution factor	: 100

11.2.2. Control of worker exposure: General measures applicable to all activities (PROC0)

Technical and organisational conditions and measures

The product is suspected of causing cancer.

Containment as appropriate.
Minimise number of staff exposed
Ensure segregation of worker from the source.
Containment in place
Provide extract ventilation to points where emissions occur.

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Good standard of general ventilation.
Avoid contact with contaminated tools and objects.
Consider technical advances and process upgrades (including automation) for the elimination of re-leases.
Regular cleaning of equipment and work area.
Only properly trained and authorised personnel shall handle the substance.
Substance-handling procedures shall be well documented and supervised.
Assumes a good basic standard of occupational hygiene is implemented

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

The product is suspected of causing cancer.

Wear suitable protective clothing.
Wear suitable gloves.
Wear suitable respiratory protection.
Use suitable eye protection.

For further specification, refer to section 8 of the SDS.

11.2.3. Control of worker exposure: Mixing or blending in batch processes; Transfer of substance or mixture (charging/discharging) at non dedicated-facilities; Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC5, PROC8a, PROC8b)

Product (article) characteristics

Concentration of substance in product	: Covers concentrations up to 3 %
Physical form of product	: Liquid
Vapour pressure	: 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)

Duration	: Covers exposure up to 8 h
Use frequency	: 220 days per year

Technical and organisational conditions and measures

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

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Inhalation - minimum efficiency of 90 %

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

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Other conditions affecting workers exposure

Indoor or outdoor use	:	Indoor use
Temperature	:	Covers use at ambient temperatures.

11.2.4. Control of worker exposure: Industrial spraying (PROC7)

Product (article) characteristics

Concentration of substance in product	:	Covers concentrations up to 3 %
Physical form of product	:	Liquid
Vapour pressure	:	0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)

Duration	:	Covers exposure up to 8 h
Use frequency	:	220 days per year

Technical and organisational conditions and measures

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Only properly trained and authorised personnel shall handle the substance.
Substance-handling procedures shall be well documented and supervised.

Local exhaust ventilation
Inhalation - minimum efficiency of 90 %

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

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Dermal - minimum efficiency of 90 %

For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

Temperature : Covers use at ambient temperatures.

11.2.5. Control of worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 3 %

Physical form of product : Liquid

Vapour pressure : 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

Use frequency : 220 days per year

Technical and organisational conditions and measures

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Local exhaust ventilation

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Inhalation - minimum efficiency of 90 %

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

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use
Temperature : Covers use at ambient temperatures.

11.3. Exposure estimation and reference to its source

11.3.1. Environmental release and exposure: Use at industrial site leading to inclusion in-to/onto article (ERC5)

Release route	Release	Release estimation method
Water, before on-site RMM	1.9 %	OECD ESD, No. 22 (OECD, 2009)
Water, after RMM	1.9 %	OECD ESD, No. 22 (OECD, 2009)
Air, before on-site RMM	34 %	CEPE SPERC 5.1a.v1
Air, after on-site RMM	1.7 %	CEPE SPERC 5.1a.v1
Soil, before on-site RMM	3.7 %	OECD ESD, No. 22 (OECD, 2009)

Compartment	Risk Characterisation Ratio (RCR)	Calculation method
All routes	< 1	ECETOC TRA

11.3.3. Worker exposure: Mixing or blending in batch processes; Transfer of substance or mixture (charging/discharging) at non dedicated-facilities; Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC5, PROC8a, PROC8b)

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Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	systemic	< 1	ECETOC TRA
All routes	-	carcinogenic effects		Qualitative assessment

Additional information on exposure estimation

The product is suspected of causing cancer.
The product is skin irritant.
Available hazard data do not enable the derivation of a DNEL for carcinogenic and dermal irritant effects.

11.3.4. Worker exposure: Industrial spraying (PROC7)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	systemic	< 1	ECETOC TRA
All routes	-	carcinogenic effects		Qualitative assessment

Additional information on exposure estimation

The product is suspected of causing cancer.
The product is skin irritant.
Available hazard data do not enable the derivation of a DNEL for carcinogenic and dermal irritant effects.

11.3.5. Worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	systemic	< 1	ECETOC TRA
All routes	-	carcinogenic effects		Qualitative assessment

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Additional information on exposure estimation

The product is suspected of causing cancer.
The product is skin irritant.
Available hazard data do not enable the derivation of a DNEL for carcinogenic and dermal irritant effects.

11.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance to Downstream Users

Fulfilling the above conditions the downstream user is deemed to work safely inside the boundaries set by this exposure scenario.
Other conditions should only be considered if the downstream user implements or recommends an exposure scenario which includes as a minimum the conditions described in this exposure scenario.

The product is suspected of causing cancer.
Therefore, exposure should be minimised by appropriate risk management measures.

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ES12: Use of paints, Professional

12.1. Title section

Structured Short Title	: Widespread use by professional workers; Coatings and paints, thinners, paint removers (PC9a).
Environmental release category(ies)	: ERC8c : Widespread use leading to inclusion into/onto article (indoor) ERC8f : Widespread use leading to inclusion into/onto article (outdoor)
Process category(ies)	: PROC10 : Roller application or brushing PROC11 : Non-industrial spraying
Product (sub) category(ies)	: PC9a : Coatings and paints, thinners, paint removers

Contributing Scenario (CS) Environment		
CS1	Widespread use leading to inclusion into/onto article (indoor)	ERC8c

Contributing Scenario (CS) Worker		
CS2	General measures applicable to all activities	PROC0
CS3	Roller application or brushing; Non-industrial spraying; Indoor use	PROC10, PROC11
CS4	Roller application or brushing; Outdoor use	PROC10
CS5	Non-industrial spraying; Outdoor use	PROC11

12.2. Conditions of use affecting exposure

12.2.1. Control of environmental exposure: Widespread use leading to inclusion into/onto article (indoor) (ERC8c)

Product (article) characteristics	
Physical form of product	: Liquid
Vapour pressure	: 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)	
Annual amount for wide disperse	: 1200 t

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uses	
Maximum allowable site tonnage (MSafe)	: Daily amount per site: 0.658 kg
Release type	: Continuous release
Emission days per year	: 365

Conditions and measures related to sewage treatment plant

STP type	: Municipal Sewage Treatment Plant Water - minimum efficiency of 89.1 %
STP effluent	: 2,000 m3/d

Conditions and measures related to treatment of waste (including article waste)

Waste disposal methods	: For general information on waste disposal see section 13.
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Other conditions affecting environmental exposure

Receiving surface water flow	: 18,000 m3/d
Local freshwater dilution factor	: 10
Local marine water dilution factor	: 100

12.2.2. Control of worker exposure: General measures applicable to all activities (PROC0)

Technical and organisational conditions and measures

The product is suspected of causing cancer.

Containment as appropriate.
Minimise number of staff exposed
Ensure segregation of worker from the source.
Containment in place
Provide extract ventilation to points where emissions occur.
Good standard of general ventilation.
Avoid contact with contaminated tools and objects.
Consider technical advances and process upgrades (including automation) for the elimination of re-leases.
Regular cleaning of equipment and work area.
Only properly trained and authorised personnel shall handle the substance.
Substance-handling procedures shall be well documented and supervised.
Assumes a good basic standard of occupational hygiene is implemented

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

The product is suspected of causing cancer.

Wear suitable protective clothing.
Wear suitable gloves.
Wear suitable respiratory protection.
Use suitable eye protection.

For further specification, refer to section 8 of the SDS.

12.2.3. Control of worker exposure: Roller application or brushing; Non-industrial spraying; Indoor use (PROC10, PROC11)

Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 3 %

Physical form of product : Liquid

Vapour pressure : 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

Use frequency : 220 days per year

Technical and organisational conditions and measures

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Only properly trained and authorised personnel shall handle the substance.
Substance-handling procedures shall be well documented and supervised.

Local exhaust ventilation
Inhalation - minimum efficiency of 90 %

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

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.

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For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Dermal - minimum efficiency of 90 %

For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

Temperature : Covers use at ambient temperatures.

12.2.4. Control of worker exposure: Roller application or brushing; Outdoor use (PROC10)

Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 3 %

Physical form of product : Liquid

Vapour pressure : 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

Use frequency : 220 days per year

Technical and organisational conditions and measures

The product is suspected of causing cancer.

The product is skin irritant.

Therefore, exposure should be minimised by appropriate risk management measures.

For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Only properly trained and authorised personnel shall handle the substance.
Substance-handling procedures shall be well documented and supervised.

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

The product is suspected of causing cancer.

The product is skin irritant.

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Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Dermal - minimum efficiency of 90 %

For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure

Indoor or outdoor use : Outdoor use

Temperature : Covers use at ambient temperatures.

12.2.5. Control of worker exposure: Non-industrial spraying; Outdoor use (PROC11)

Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 3 %

Physical form of product : Liquid

Vapour pressure : 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

Use frequency : 220 days per year

Technical and organisational conditions and measures

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Only properly trained and authorised personnel shall handle the substance.
Substance-handling procedures shall be well documented and strictly supervised.

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

The product is suspected of causing cancer.

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The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Dermal - minimum efficiency of 95 %

For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure

Indoor or outdoor use : Outdoor use

Temperature : Covers use at ambient temperatures.

12.3. Exposure estimation and reference to its source

12.3.1. Environmental release and exposure: Widespread use leading to inclusion into/onto article (indoor) (ERC8c)

Release route	Release	Release estimation method
Water	1 %	ERC based
Air	15 %	ERC based
Soil	0.5 %	ERC8f
Soil	0 %	ERC8c

Compartment	Risk Characterisation Ratio (RCR)	Calculation method
All routes	< 1	ECETOC TRA

12.3.3. Worker exposure: Roller application or brushing; Non-industrial spraying; Indoor use (PROC10, PROC11)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	systemic	< 1	ECETOC TRA
All routes	-	carcinogenic ef-		Qualitative as-

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Additional information on exposure estimation

The product is suspected of causing cancer.
The product is skin irritant.
Available hazard data do not enable the derivation of a DNEL for carcinogenic and dermal irritant effects.

12.3.4. Worker exposure: Roller application or brushing; Outdoor use (PROC10)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	systemic	< 1	ECETOC TRA
All routes	-	carcinogenic effects		Qualitative assessment

Additional information on exposure estimation

The product is suspected of causing cancer.
The product is skin irritant.
Available hazard data do not enable the derivation of a DNEL for carcinogenic and dermal irritant effects.

12.3.5. Worker exposure: Non-industrial spraying; Outdoor use (PROC11)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	systemic	< 1	ECETOC TRA
All routes	-	carcinogenic effects		Qualitative assessment

Additional information on exposure estimation

The product is suspected of causing cancer.
The product is skin irritant.
Available hazard data do not enable the derivation of a DNEL for carcinogenic and dermal irritant effects.

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12.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance to Downstream Users

Fulfilling the above conditions the downstream user is deemed to work safely inside the boundaries set by this exposure scenario.

Other conditions should only be considered if the downstream user implements or recommends an exposure scenario which includes as a minimum the conditions described in this exposure scenario.

The product is suspected of causing cancer.

Therefore, exposure should be minimised by appropriate risk management measures.

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ES13: Use of paints, Consumer

13.1. Title section

Structured Short Title	: Consumer use; Coatings and paints, thinners, paint removers (PC9a).
Environmental release category(ies)	: ERC8c : Widespread use leading to inclusion into/onto article (indoor) ERC8f : Widespread use leading to inclusion into/onto article (outdoor)
Product (sub) category(ies)	: PC9a : Coatings and paints, thinners, paint removers

Contributing Scenario (CS) Environment		
CS1	Widespread use leading to inclusion into/onto article (indoor)	ERC8c

Contributing Scenario (CS) Consumer		
CS2	Coatings and paints, thinners, paint removers; Rolling, Brushing	PC9a
CS3	Coatings and paints, thinners, paint removers; Spraying	PC9a

13.2. Conditions of use affecting exposure

13.2.1. Control of environmental exposure: Widespread use leading to inclusion into/onto article (indoor) (ERC8c)

Product (article) characteristics	
Physical form of product	: Liquid
Vapour pressure	: 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)	
Annual amount for wide disperse uses	: 1200 t
Maximum allowable site tonnage (MSafe)	: 0.658 kgDaily amount per site:
Release type	: Continuous release

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Emission days per year	: 365
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Conditions and measures related to sewage treatment plant

STP type	: Municipal Sewage Treatment Plant Water - minimum efficiency of 89.1 %
STP effluent	: 2,000 m3/d

Conditions and measures related to treatment of waste (including article waste)

Waste disposal methods	: For general information on waste disposal see section 13.
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Other conditions affecting environmental exposure

Receiving surface water flow	: 18,000 m3/d
Local freshwater dilution factor	: 10
Local marine water dilution factor	: 100

13.2.2. Control of consumer exposure: Coatings and paints, thinners, paint removers; Rolling, Brushing (PC9a)

Product (article) characteristics

Concentration of substance in product	: Covers concentrations up to 2 %
Physical form of product	: Liquid
Vapour pressure	: 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)

Duration	: Covers use up to: 120 min
Duration	: Covers exposure up to: 132 min
Use frequency	: 1 times per year
Wall paint	: Covers frequency up to: 2 times per year
Solvent rich paint	: Applied amount : 1,000 g/event
High solid paint	: Applied amount : 1,300 g/event
Wall paint	: Applied amount : 3,750 g/event
Waterborne paint	: Applied amount : 1,250 g/event

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Other conditions affecting consumers exposure

Indoor or outdoor use	:	Covers indoor and outdoor use.
Room size	:	20 m ³
Temperature	:	Covers use at ambient temperatures.
Ventilation rate	:	air changes per hour 0.6

13.2.3. Control of consumer exposure: Coatings and paints, thinners, paint removers; Spraying (PC9a)

Product (article) characteristics

Concentration of substance in product	:	Covers concentrations up to 2 %
Physical form of product	:	Liquid
Vapour pressure	:	0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)

Duration	:	Covers use up to: 800 s
Duration	:	Covers exposure up to: 25 min
Use frequency	:	2 times per year
Solvent rich paint	:	Applied amount : 1,000 g/event
High solid paint	:	Applied amount : 1,300 g/event
Wall paint	:	Applied amount : 3,750 g/event
Waterborne paint	:	Applied amount : 1,250 g/event

Other conditions affecting consumers exposure

Indoor or outdoor use	:	Indoor use
Room size	:	34 m ³
Temperature	:	Covers use at ambient temperatures.
Ventilation rate	:	air changes per hour 1.5

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13.3. Exposure estimation and reference to its source

13.3.1. Environmental release and exposure: Widespread use leading to inclusion into/onto article (indoor) (ERC8c)

Release route	Release	Release estimation method
Water	1 %	ERC based
Air	15 %	ERC based
Soil	0.5 %	ERC8f
Soil	0 %	ERC8c

Compartment	Risk Characterisation Ratio (RCR)	Calculation method
All routes	< 1	ECETOC TRA

13.3.2. Consumer exposure: Coatings and paints, thinners, paint removers; Rolling, Brushing (PC9a)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	-	< 1	Consexpo v4.1

Additional information on exposure estimation

Oral exposure is considered to be not relevant.

13.3.3. Consumer exposure: Coatings and paints, thinners, paint removers; Spraying (PC9a)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	-	< 1	Consexpo v4.1

Additional information on exposure estimation

Oral exposure is considered to be not relevant.

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13.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance to Downstream Users
Not applicable

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ES14: Formulation of PUR coatings and adhesives, Industrial

14.1. Title section

Structured Short Title	: Formulation or re-packing; Various products (PC1, PC9a, PC32); Manufacture of plastics products, including compounding and conversion (SU12).
Environmental release category(ies)	: ERC2: Formulation into mixture
Process category(ies)	: PROC5: Mixing or blending in batch processes PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing)
Product (sub) category(ies)	: PC1: Adhesives, sealants PC9a: Coatings and paints, thinners, paint removers PC32: Polymer preparations and compounds
Sector(s) of use	: SU12: Manufacture of plastics products, including compounding and conversion

Contributing Scenario (CS) Environment

CS1	Formulation into mixture	ERC2
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Contributing Scenario (CS) Worker

CS2	General measures applicable to all activities	PROC0
CS3	Mixing or blending in batch processes; Transfer of substance or mixture (charging/discharging) at dedicated facilities; Transfer of substance or mixture into small containers (dedicated filling line, including weighing)	PROC5, PROC8b, PROC9

14.2. Conditions of use affecting exposure

14.2.1. Control of environmental exposure: Formulation into mixture (ERC2)

Remarks:

ERC only for communication purposes.

Product (article) characteristics	
Physical form of product	: Liquid

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Vapour pressure	: 0.000346 Pa (25 °C)
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Amount used, frequency and duration of use (or from service life)

Maximum allowable site tonnage (MSafe)	: Daily amount per site: 20 t
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Technical and organisational conditions and measures

Suitable technique(s) to limit releases to air:
Treat air emissions.
Air - minimum efficiency of 90 %

Conditions and measures related to sewage treatment plant

STP type	: Municipal Sewage Treatment Plant Water - minimum efficiency of 89.1 %
STP sludge treatment	: Recovery Methods
STP effluent	: 2,000 m3/d

Conditions and measures related to treatment of waste (including article waste)

Waste treatment	: Incineration
Waste disposal methods	: For general information on waste disposal see section 13.

Other conditions affecting environmental exposure

Receiving surface water flow	: 18,000 m3/d
Local freshwater dilution factor	: 10
Local marine water dilution factor	: 100

14.2.2. Control of worker exposure: General measures applicable to all activities (PROC0)

Technical and organisational conditions and measures

The product is suspected of causing cancer.

Containment as appropriate.
Minimise number of staff exposed
Ensure segregation of worker from the source.
Containment in place
Provide extract ventilation to points where emissions occur.

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Good standard of general ventilation.
Avoid contact with contaminated tools and objects.
Consider technical advances and process upgrades (including automation) for the elimination of re-leases.
Regular cleaning of equipment and work area.
Only properly trained and authorised personnel shall handle the substance.
Substance-handling procedures shall be well documented and supervised.
Assumes a good basic standard of occupational hygiene is implemented

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

The product is suspected of causing cancer.

Wear suitable protective clothing.
Wear suitable gloves.
Wear suitable respiratory protection.
Use suitable eye protection.

For further specification, refer to section 8 of the SDS.

14.2.3. Control of worker exposure: Mixing or blending in batch processes; Transfer of substance or mixture (charging/discharging) at dedicated facilities; Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC5, PROC8b, PROC9)

Product (article) characteristics

Concentration of substance in product	: Covers concentrations up to 3 %
Physical form of product	: Liquid
Vapour pressure	: 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)

Duration	: Covers exposure up to 8 h
Use frequency	: 220 days per year

Technical and organisational conditions and measures

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Only properly trained and authorised personnel shall handle the substance.

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Substance-handling procedures shall be well documented and supervised.

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

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Dermal - minimum efficiency of 90 %

For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

Temperature : Covers use at ambient temperatures.

14.3. Exposure estimation and reference to its source

14.3.1. Environmental release and exposure: Formulation into mixture (ERC2)

Release route	Release	Release estimation method
Water, after RMM	0.035 %	OECD ESD, No. 3 (OECD, 2004/2009)
Air, after on-site RMM	0.025 %	OECD ESD, No. 3 (OECD, 2004/2009)
Soil	0 %	OECD ESD, No. 3 (OECD, 2004/2009)

Compartment	Risk Characterisation Ratio (RCR)	Calculation method
All routes	< 1	ECETOC TRA

14.3.3. Worker exposure: Mixing or blending in batch processes; Transfer of substance or mixture (charging/discharging) at dedicated facilities; Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC5, PROC8b, PROC9)

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Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	systemic	< 1	ECETOC TRA
All routes	-	carcinogenic effects		Qualitative assessment

Additional information on exposure estimation

The product is suspected of causing cancer.
The product is skin irritant.
Available hazard data do not enable the derivation of a DNEL for carcinogenic and dermal irritant effects.

14.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance to Downstream Users

Fulfilling the above conditions the downstream user is deemed to work safely inside the boundaries set by this exposure scenario.
Other conditions should only be considered if the downstream user implements or recommends an exposure scenario which includes as a minimum the conditions described in this exposure scenario.

The product is suspected of causing cancer.
Therefore, exposure should be minimised by appropriate risk management measures.

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ES15: PUR coatings and adhesives, Industrial

15.1. Title section

Structured Short Title	: Use at industrial sites; Various products (PC1, PC9a, PC32); Various sectors (SU12, SU16, SU17, SU19).
Environmental release category(ies)	: ERC5: Use at industrial site leading to inclusion into/onto article
Process category(ies)	: PROC5: Mixing or blending in batch processes PROC6: Calendering operations PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities PROC11: Non-industrial spraying PROC14: Tableting, compression, extrusion, pelettisation, granulation
Product (sub) category(ies)	: PC1: Adhesives, sealants PC9a: Coatings and paints, thinners, paint removers PC32: Polymer preparations and compounds
Sector(s) of use	: SU12: Manufacture of plastics products, including compounding and conversion SU16: Manufacture of computer, electronic and optical products, electrical equipment SU17: General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment SU19: Building and construction work

Contributing Scenario (CS) Environment

CS1	Use at industrial site leading to inclusion into/onto article	ERC5
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Contributing Scenario (CS) Worker

CS2	General measures applicable to all activities	PROC0
CS3	Mixing or blending in batch processes; Calendering operations; Transfer of substance or mixture (charging/discharging) at non dedicated-facilities; Transfer of substance or mixture (charging/discharging) at dedicated facilities; Roller application or brushing; Tableting, compression, extrusion, pelettisation, granulation	PROC5, PROC6, PROC8a, PROC8b, PROC10, PROC14

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15.2. Conditions of use affecting exposure

15.2.1. Control of environmental exposure: Use at industrial site leading to inclusion into/onto article (ERC5)

Product (article) characteristics	
Physical form of product	: Liquid
Vapour pressure	: 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)	
Maximum allowable site tonnage (MSafe)	: Daily amount per site: 2,080 kg

Technical and organisational conditions and measures	
Suitable technique(s) to limit releases to air: Air-emission abatement such as scrubbers and filters should be used for waste gas. Air - minimum efficiency of 90 %	

Conditions and measures related to sewage treatment plant	
STP type	: Municipal Sewage Treatment Plant Water - minimum efficiency of 89.1 %
STP sludge treatment	: Recovery Methods
STP effluent	: 2,000 m3/d

Conditions and measures related to treatment of waste (including article waste)	
Waste treatment	: Incineration, disposal or recycling at specific offsite provider
Waste disposal methods	: For general information on waste disposal see section 13.

Other conditions affecting environmental exposure	
Receiving surface water flow	: 18,000 m3/d
Local freshwater dilution factor	: 10
Local marine water dilution factor	: 100

15.2.2. Control of worker exposure: General measures applicable to all activities (PROC0)

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Technical and organisational conditions and measures

The product is suspected of causing cancer.

Containment as appropriate.
Minimise number of staff exposed
Ensure segregation of worker from the source.
Containment in place
Provide extract ventilation to points where emissions occur.
Good standard of general ventilation.
Avoid contact with contaminated tools and objects.
Consider technical advances and process upgrades (including automation) for the elimination of re-leases.
Regular cleaning of equipment and work area.
Only properly trained and authorised personnel shall handle the substance.
Substance-handling procedures shall be well documented and supervised.
Assumes a good basic standard of occupational hygiene is implemented

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

The product is suspected of causing cancer.

Wear suitable protective clothing.
Wear suitable gloves.
Wear suitable respiratory protection.
Use suitable eye protection.

For further specification, refer to section 8 of the SDS.

15.2.3. Control of worker exposure: Mixing or blending in batch processes; Calendering operations; Transfer of substance or mixture (charging/discharging) at non dedicated-facilities; Transfer of substance or mixture (charging/discharging) at dedicated facilities; Roller application or brushing; Tableting, compression, extrusion, pelettisation, granulation (PROC5, PROC6, PROC8a, PROC8b, PROC10, PROC14)

Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 3 %

Physical form of product : Liquid

Vapour pressure : 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

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Use frequency	: 220 days per year
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Technical and organisational conditions and measures

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Only properly trained and authorised personnel shall handle the substance.
Substance-handling procedures shall be well documented and supervised.

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

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Dermal - minimum efficiency of 90 %

For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure

Indoor or outdoor use	: Indoor use
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Temperature	: Covers use at ambient temperatures.
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15.3. Exposure estimation and reference to its source

15.3.1. Environmental release and exposure: Use at industrial site leading to inclusion in-to/onto article (ERC5)

Release route	Release	Release estimation method
Water	0.7 %	ESVOC SPERC 4.3a.v1
Air, before on-site RMM	98 %	ESVOC SPERC 4.3a.v1
Air, after on-site RMM	9.8 %	ESVOC SPERC 4.3a.v1
Soil, before on-site RMM	0 %	ESVOC SPERC 4.3a.v1

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Compartment	Risk Characterisation Ratio (RCR)	Calculation method
All routes	< 1	ECETOC TRA

15.3.3. Worker exposure: Mixing or blending in batch processes; Calendering operations; Transfer of substance or mixture (charging/discharging) at non dedicated-facilities; Transfer of substance or mixture (charging/discharging) at dedicated facilities; Roller application or brushing; Tableting, compression, extrusion, pelettisation, granulation (PROC5, PROC6, PROC8a, PROC8b, PROC10, PROC14)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	systemic	< 1	ECETOC TRA
All routes	-	carcinogenic effects		Qualitative assessment

Additional information on exposure estimation

The product is suspected of causing cancer.
The product is skin irritant.
Available hazard data do not enable the derivation of a DNEL for carcinogenic and dermal irritant effects.

15.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance to Downstream Users

Fulfilling the above conditions the downstream user is deemed to work safely inside the boundaries set by this exposure scenario.
Other conditions should only be considered if the downstream user implements or recommends an exposure scenario which includes as a minimum the conditions described in this exposure scenario.

The product is suspected of causing cancer.
Therefore, exposure should be minimised by appropriate risk management measures.

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ES16: PUR coatings and adhesives, Professional

16.1. Title section

Structured Short Title	: Widespread use by professional workers; Various products (PC1, PC9a, PC32); Various sectors (SU12, SU13).
Environmental release category(ies)	: ERC8c : Widespread use leading to inclusion into/onto article (indoor) ERC8f : Widespread use leading to inclusion into/onto article (outdoor)
Process category(ies)	: PROC5 : Mixing or blending in batch processes PROC8a : Transfer of substance or mixture (charging/discharging) at non dedicated-facilities PROC8b : Transfer of substance or mixture (charging/discharging) at dedicated facilities PROC10 : Roller application or brushing PROC11 : Non-industrial spraying PROC13 : Treatment of articles by dipping and pouring PROC19 : Manual activities involving hand contact
Product (sub) category(ies)	: PC1 : Adhesives, sealants PC9a : Coatings and paints, thinners, paint removers PC32 : Polymer preparations and compounds
Sector(s) of use	: SU12 : Manufacture of plastics products, including compounding and conversion SU13 : Manufacture of other non-metallic mineral products, e.g. plasters, cement

Contributing Scenario (CS) Environment

CS1	Widespread use leading to inclusion into/onto article (indoor)	ERC8c
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Contributing Scenario (CS) Worker

CS2	General measures applicable to all activities	PROC0
CS3	Mixing or blending in batch processes; Transfer of substance or mixture (charging/discharging) at non dedicated-facilities; Roller application or brushing; Non-industrial spraying; Treatment of articles by dipping and pouring; Manual activities involving hand contact	PROC5, PROC8a, PROC10, PROC11, PROC13, PROC19
CS4	Mixing or blending in batch processes; Transfer of substance or mixture (charging/discharging) at non dedicated-facilities; Transfer of substance or mixture (charging/discharging) at dedicated facilities; Outdoor use	PROC5, PROC8a, PROC8b

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CS5	Roller application or brushing; Non-industrial spraying; Treatment of articles by dipping and pouring; Manual activities involving hand contact; Outdoor use	PROC10, PROC11, PROC13, PROC19
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16.2. Conditions of use affecting exposure

16.2.1. Control of environmental exposure: Widespread use leading to inclusion into/onto article (indoor) (ERC8c)

Product (article) characteristics	
Physical form of product	: Liquid
Vapour pressure	: 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)	
Annual amount for wide disperse uses	: 1200 t
Maximum allowable site tonnage (MSafe)	: Daily amount per site: 0.658 kg
Release type	: Continuous release
Emission days per year	: 365

Conditions and measures related to sewage treatment plant	
STP type	: Municipal Sewage Treatment Plant Water - minimum efficiency of 89.1 %
STP effluent	: 2,000 m3/d

Conditions and measures related to treatment of waste (including article waste)	
Waste disposal methods	: For general information on waste disposal see section 13.

Other conditions affecting environmental exposure	
Receiving surface water flow	: 18,000 m3/d
Local freshwater dilution factor	: 10
Local marine water dilution factor	: 100

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16.2.2. Control of worker exposure: General measures applicable to all activities (PROC0)

Technical and organisational conditions and measures
The product is suspected of causing cancer.
Containment as appropriate. Minimise number of staff exposed Ensure segregation of worker from the source. Containment in place Provide extract ventilation to points where emissions occur. Good standard of general ventilation. Avoid contact with contaminated tools and objects. Consider technical advances and process upgrades (including automation) for the elimination of re-leases. Regular cleaning of equipment and work area. Only properly trained and authorised personnel shall handle the substance. Substance-handling procedures shall be well documented and supervised. Assumes a good basic standard of occupational hygiene is implemented

Conditions and measures related to personal protection, hygiene and health evaluation
The product is suspected of causing cancer.
Wear suitable protective clothing. Wear suitable gloves. Wear suitable respiratory protection. Use suitable eye protection.
For further specification, refer to section 8 of the SDS.

16.2.3. Control of worker exposure: Mixing or blending in batch processes; Transfer of substance or mixture (charging/discharging) at non dedicated-facilities; Roller application or brushing; Non-industrial spraying; Treatment of articles by dipping and pouring; Manual activities involving hand contact (PROC5, PROC8a, PROC10, PROC11, PROC13, PROC19)

Product (article) characteristics
Concentration of substance in product : Covers concentrations up to 3 %
Physical form of product : Liquid
Vapour pressure : 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)
Duration : Covers exposure up to 8 h

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Use frequency	: 220 days per year
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Technical and organisational conditions and measures

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Only properly trained and authorised personnel shall handle the substance.
Substance-handling procedures shall be well documented and supervised.

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

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Dermal - minimum efficiency of 90 %

For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure

Indoor or outdoor use	: Indoor use
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Temperature	: Covers use at ambient temperatures.
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16.2.4. Control of worker exposure: Mixing or blending in batch processes; Transfer of substance or mixture (charging/discharging) at non dedicated-facilities; Transfer of substance or mixture (charging/discharging) at dedicated facilities; Outdoor use (PROC5, PROC8a, PROC8b)

Product (article) characteristics

Concentration of substance in product	: Covers concentrations up to 3 %
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Physical form of product	: Liquid
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Vapour pressure	: 0.000346 Pa (25 °C)
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Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

Use frequency : 220 days per year

Technical and organisational conditions and measures

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Only properly trained and authorised personnel shall handle the substance.
Substance-handling procedures shall be well documented and supervised.

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

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Dermal - minimum efficiency of 90 %

For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure

Indoor or outdoor use : Outdoor use

Temperature : Covers use at ambient temperatures.

16.2.5. Control of worker exposure: Roller application or brushing; Non-industrial spraying; Treatment of articles by dipping and pouring; Manual activities involving hand contact; Outdoor use (PROC10, PROC11, PROC13, PROC19)

Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 3 %

Physical form of product : Liquid

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Vapour pressure	: 0.000346 Pa (25 °C)
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Amount used, frequency and duration of use (or from service life)

Duration	: Covers exposure up to 8 h
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Use frequency	: 220 days per year
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Technical and organisational conditions and measures

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Only properly trained and authorised personnel shall handle the substance.
Substance-handling procedures shall be well documented and strictly supervised.

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

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Dermal - minimum efficiency of 95 %

For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure

Indoor or outdoor use	: Outdoor use
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Temperature	: Covers use at ambient temperatures.
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16.3. Exposure estimation and reference to its source

16.3.1. Environmental release and exposure: Widespread use leading to inclusion into/onto article (indoor) (ERC8c)

Release route	Release	Release estimation method
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Water	1 %	ERC based
Air	15 %	ERC based
Soil	0.5 %	ERC8f
Soil	0 %	ERC8c

Compartment	Risk Characterisation Ratio (RCR)	Calculation method
All routes	< 1	ECETOC TRA

16.3.3. Worker exposure: Mixing or blending in batch processes; Transfer of substance or mixture (charging/discharging) at non dedicated-facilities; Roller application or brushing; Non-industrial spraying; Treatment of articles by dipping and pouring; Manual activities involving hand contact (PROC5, PROC8a, PROC10, PROC11, PROC13, PROC19)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	systemic	< 1	ECETOC TRA
All routes	-	carcinogenic effects		Qualitative assessment

Additional information on exposure estimation

The product is suspected of causing cancer.
The product is skin irritant.
Available hazard data do not enable the derivation of a DNEL for carcinogenic and dermal irritant effects.

16.3.4. Worker exposure: Mixing or blending in batch processes; Transfer of substance or mixture (charging/discharging) at non dedicated-facilities; Transfer of substance or mixture (charging/discharging) at dedicated facilities; Outdoor use (PROC5, PROC8a, PROC8b)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	systemic	< 1	ECETOC TRA
All routes	-	carcinogenic effects		Qualitative assessment

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Additional information on exposure estimation

The product is suspected of causing cancer.
The product is skin irritant.
Available hazard data do not enable the derivation of a DNEL for carcinogenic and dermal irritant effects.

16.3.5. Worker exposure: Roller application or brushing; Non-industrial spraying; Treatment of articles by dipping and pouring; Manual activities involving hand contact; Outdoor use (PROC10, PROC11, PROC13, PROC19)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	systemic	< 1	ECETOC TRA
All routes	-	carcinogenic effects		Qualitative assessment

Additional information on exposure estimation

The product is suspected of causing cancer.
The product is skin irritant.
Available hazard data do not enable the derivation of a DNEL for carcinogenic and dermal irritant effects.

16.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance to Downstream Users

Fulfilling the above conditions the downstream user is deemed to work safely inside the boundaries set by this exposure scenario.
Other conditions should only be considered if the downstream user implements or recommends an exposure scenario which includes as a minimum the conditions described in this exposure scenario.

The product is suspected of causing cancer.
Therefore, exposure should be minimised by appropriate risk management measures.

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ES17: PUR coatings and adhesives, Consumer

17.1. Title section

Structured Short Title	: Consumer use; Various products (PC1, PC9a, PC32); Various sectors (SU12, SU13).
Environmental release category(ies)	: ERC8c : Widespread use leading to inclusion into/onto article (indoor) ERC8f : Widespread use leading to inclusion into/onto article (outdoor)
Product (sub) category(ies)	: PC1 : Adhesives, sealants PC9a : Coatings and paints, thinners, paint removers PC32 : Polymer preparations and compounds

Contributing Scenario (CS) Environment		
CS1	Widespread use leading to inclusion into/onto article (indoor)	ERC8c

Contributing Scenario (CS) Consumer		
CS2	Adhesives	PC1
CS3	Coatings	PC9a

17.2. Conditions of use affecting exposure

17.2.1. Control of environmental exposure: Widespread use leading to inclusion into/onto article (indoor) (ERC8c)

Product (article) characteristics	
Physical form of product	: Liquid
Vapour pressure	: 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)	
Annual amount for wide disperse uses	: 1200 t
Maximum allowable site tonnage (MSafe)	: 0.658 kgDaily amount per site:

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Release type	: Continuous release
Emission days per year	: 365

Conditions and measures related to sewage treatment plant

STP type	: Municipal Sewage Treatment Plant Water - minimum efficiency of 89.1 %
STP effluent	: 2,000 m3/d

Conditions and measures related to treatment of waste (including article waste)

Waste disposal methods	: For general information on waste disposal see section 13.
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Other conditions affecting environmental exposure

Receiving surface water flow	: 18,000 m3/d
Local freshwater dilution factor	: 10
Local marine water dilution factor	: 100

17.2.2. Control of consumer exposure: Adhesives (PC1)

Product (article) characteristics

Concentration of substance in product	: Covers concentrations up to 3 %
Physical form of product	: Liquid
Vapour pressure	: 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)

Amounts used (Inhalation exposure)	: 250 g
Amounts used (Dermal exposure)	: 0.25 g
Duration	: Covers use up to: 30 min
Duration	: Covers exposure up to: 4 h
Use frequency	: 2 times per year

Other conditions affecting consumers exposure

Indoor or outdoor use	: Covers indoor and outdoor use.
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Room size	:	20 m ³
Temperature	:	Covers use at ambient temperatures.
Ventilation rate	:	air changes per hour 0.6

17.2.3. Control of consumer exposure: Coatings (PC9a)

Product (article) characteristics	
Concentration of substance in product	: Covers concentrations up to 3 %
Physical form of product	: Liquid
Vapour pressure	: 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)	
Amounts used (Inhalation exposure)	: 3000 g
Amounts used (Dermal exposure)	: 0.25 g
Duration	: Covers use up to: 1 h
Duration	: Covers exposure up to: 1 h
Use frequency	: 0.33 times per year

Other conditions affecting consumers exposure	
Indoor or outdoor use	: Covers indoor and outdoor use.
Room size	: 34 m ³
Temperature	: Covers use at ambient temperatures.
Ventilation rate	: air changes per hour 1.5

17.3. Exposure estimation and reference to its source

17.3.1. Environmental release and exposure: Widespread use leading to inclusion into/onto article (indoor) (ERC8c)

Release route	Release	Release estimation method
Water	1 %	ERC based
Air	15 %	ERC based
Soil	0.5 %	ERC8f

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Soil	0 %	ERC8c
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Compartment	Risk Characterisation Ratio (RCR)	Calculation method
All routes	< 1	ECETOC TRA

17.3.2. Consumer exposure: Adhesives (PC1)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	-	< 1	Consexpo v4.1

Additional information on exposure estimation

Inhalation model: exposure to vapour - Evaporation from increasing area
Dermal model: instant application
Oral exposure is considered to be not relevant.

17.3.3. Consumer exposure: Coatings (PC9a)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	-	< 1	Consexpo v4.1

Additional information on exposure estimation

Inhalation model: exposure to vapour - Evaporation from increasing area
Dermal model: instant application
Oral exposure is considered to be not relevant.

17.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance to Downstream Users

Not applicable

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ES18: Service life of paints, coatings and adhesives, Consumer

18.1. Title section

Structured Short Title	: Consumer use; Various products (PC1, PC9a); Various articles (AC1, AC2, AC4, AC7, AC8, AC11, AC13).
Environmental release category(ies)	: ERC11b : Widespread use of articles with high or intended release (indoor) ERC10b : Widespread use of articles with high or intended release (outdoor)
Product (sub) category(ies)	: PC1 : Adhesives, sealants PC9a : Coatings and paints, thinners, paint removers
Article (sub) category(ies)	: AC1 : Vehicles AC2 : Machinery, mechanical appliances, electrical/electronic articles AC4 : Stone, plaster, cement, glass and ceramic articles AC7 : Metal articles AC8 : Paper articles AC11 : Wood articles AC13 : Plastic articles

Contributing Scenario (CS) Environment		
CS1	Widespread use of articles with high or intended release (indoor); Widespread use of articles with high or intended release (outdoor)	ERC11b, ERC10b

Contributing Scenario (CS) Consumer		
CS2	Coatings and paints, thinners, paint removers; Rolling, Brushing	PC9a
CS3	Coatings and paints, thinners, paint removers; Spraying	PC9a
CS4	Adhesives	PC1
CS5	Coatings	PC9a

18.2. Conditions of use affecting exposure

18.2.1. Control of environmental exposure: Widespread use of articles with high or intended release (indoor); Widespread use of articles with high or intended release (outdoor) (ERC11b, ERC10b)

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Product (article) characteristics	
Physical form of product	: Liquid
Vapour pressure	: 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)	
Annual amount for wide disperse uses	: 1200 t
Maximum allowable site tonnage (MSafe)	: 0.658 kgDaily amount per site:
Release type	: Continuous release
Emission days per year	: 365

Conditions and measures related to sewage treatment plant	
STP type	: Municipal Sewage Treatment Plant Water - minimum efficiency of 89.1 %
STP effluent	: 2,000 m3/d

Conditions and measures related to treatment of waste (including article waste)	
Waste disposal methods	: For general information on waste disposal see section 13.

Other conditions affecting environmental exposure	
Receiving surface water flow	: 18,000 m3/d
Local freshwater dilution factor	: 10
Local marine water dilution factor	: 100

18.2.2. Control of consumer exposure: Coatings and paints, thinners, paint removers; Rolling, Brushing (PC9a)

Product (article) characteristics	
Concentration of substance in product	: Covers concentrations up to 2 %
Physical form of product	: Liquid
Vapour pressure	: 0.000346 Pa (25 °C)

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Amount used, frequency and duration of use (or from service life)	
Duration	: Covers use up to: 120 min
Duration	: Covers exposure up to: 132 min
Use frequency	: 1 times per year
Wall paint	: Covers frequency up to: 2 times per year
Solvent rich paint	: Applied amount : 1,000 g/event
High solid paint	: Applied amount : 1,300 g/event
Wall paint	: Applied amount : 3,750 g/event
Waterborne paint	: Applied amount : 1,250 g/event

Other conditions affecting consumers exposure	
Indoor or outdoor use	: Covers indoor and outdoor use.
Room size	: 20 m ³
Temperature	: Covers use at ambient temperatures.
Ventilation rate	: air changes per hour 0.6

18.2.3. Control of consumer exposure: Coatings and paints, thinners, paint removers; Spraying (PC9a)

Product (article) characteristics	
Concentration of substance in product	: Covers concentrations up to 2 %
Physical form of product	: Liquid
Vapour pressure	: 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)	
Duration	: Covers use up to: 800 s
Duration	: Covers exposure up to: 25 min
Use frequency	: 2 times per year
Solvent rich paint	: Applied amount : 1,000 g/event
High solid paint	: Applied amount : 1,300 g/event
Wall paint	: Applied amount : 3,750 g/event
Waterborne paint	: Applied amount : 1,250 g/event

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Other conditions affecting consumers exposure	
Indoor or outdoor use	: Indoor use
Room size	: 34 m ³
Temperature	: Covers use at ambient temperatures.
Ventilation rate	: air changes per hour 1.5

18.2.4. Control of consumer exposure: Adhesives (PC1)

Product (article) characteristics	
Concentration of substance in product	: Covers concentrations up to 3 %
Physical form of product	: Liquid
Vapour pressure	: 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)	
Amounts used (Inhalation exposure)	: 250 g
Amounts used (Dermal exposure)	: 0.25 g
Duration	: Covers use up to: 30 min
Duration	: Covers exposure up to: 4 h
Use frequency	: 2 times per year

Other conditions affecting consumers exposure	
Indoor or outdoor use	: Covers indoor and outdoor use.
Room size	: 20 m ³
Temperature	: Covers use at ambient temperatures.
Ventilation rate	: air changes per hour 0.6

18.2.5. Control of consumer exposure: Coatings (PC9a)

Product (article) characteristics	
Concentration of substance in product	: Covers concentrations up to 3 %
Physical form of product	: Liquid

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Vapour pressure : 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)

Amounts used (Inhalation exposure) : 3000 g
Amounts used (Dermal exposure) : 0.25 g
Duration : Covers use up to: 1 h
Duration : Covers exposure up to: 1 h
Use frequency : 0.33 times per year

Other conditions affecting consumers exposure

Indoor or outdoor use : Covers indoor and outdoor use.
Room size : 34 m³
Temperature : Covers use at ambient temperatures.
Ventilation rate : air changes per hour 1.5

18.3. Exposure estimation and reference to its source

18.3.1. Environmental release and exposure: Widespread use of articles with high or intended release (indoor); Widespread use of articles with high or intended release (outdoor) (ERC11b, ERC10b)

Release route	Release	Release estimation method
Water	100 %	ERC based
Air	100 %	ERC based
Soil	100 %	ERC10b
Soil	0 %	ERC11b

Compartment	Risk Characterisation Ratio (RCR)	Calculation method
All routes	< 1	ECETOC TRA

18.3.2. Consumer exposure: Coatings and paints, thinners, paint removers; Rolling, Brushing (PC9a)

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Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	-	< 1	Consexpo v4.1

Additional information on exposure estimation

Oral exposure is considered to be not relevant.

18.3.3. Consumer exposure: Coatings and paints, thinners, paint removers; Spraying (PC9a)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	-	< 1	Consexpo v4.1

Additional information on exposure estimation

Oral exposure is considered to be not relevant.

18.3.4. Consumer exposure: Adhesives (PC1)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	-	< 1	Consexpo v4.1

Additional information on exposure estimation

Inhalation model: exposure to vapour - Evaporation from increasing area
Dermal model: instant application
Oral exposure is considered to be not relevant.

18.3.5. Consumer exposure: Coatings (PC9a)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	-	< 1	Consexpo v4.1

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Additional information on exposure estimation

Inhalation model: exposure to vapour - Evaporation from increasing area
Dermal model: instant application
Oral exposure is considered to be not relevant.

18.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance to Downstream Users

Not applicable

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ES19: Use in laboratories, Professional

19.1. Title section

Structured Short Title	: Widespread use by professional workers; Laboratory chemicals (PC21); Scientific research and development (SU24).
Environmental release category(ies)	: ERC6a: Use of intermediate ERC6b: Use of reactive processing aid at industrial site (no inclusion into or onto article)
Process category(ies)	: PROC15: Use as laboratory reagent
Product (sub) category(ies)	: PC21: Laboratory chemicals
Sector(s) of use	: SU24: Scientific research and development

Contributing Scenario (CS) Environment		
CS1	Use of intermediate; Use of reactive processing aid at industrial site (no inclusion into or onto article)	ERC6a, ERC6b

Contributing Scenario (CS) Worker		
CS2	General measures applicable to all activities	PROC0
CS3	Use as laboratory reagent	PROC15

19.2. Conditions of use affecting exposure

19.2.1. Control of environmental exposure: Use of intermediate; Use of reactive processing aid at industrial site (no inclusion into or onto article) (ERC6a, ERC6b)

Remarks:

ERCs for communication purposes only.

Product (article) characteristics	
Physical form of product	: Liquid
Vapour pressure	: 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)	
Maximum allowable site tonnage (MSafe)	: Daily amount per site: 100 kg

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Conditions and measures related to sewage treatment plant

STP type	:	Municipal Sewage Treatment Plant Water - minimum efficiency of 89.1 %
STP sludge treatment	:	Recovery Methods
STP effluent	:	2,000 m3/d

Conditions and measures related to treatment of waste (including article waste)

Waste treatment	:	Incineration, disposal or recycling at specific offsite provider
Waste disposal methods	:	For general information on waste disposal see section 13.

Other conditions affecting environmental exposure

Receiving surface water flow	:	18,000 m3/d
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

19.2.2. Control of worker exposure: General measures applicable to all activities (PROC0)

Technical and organisational conditions and measures

The product is suspected of causing cancer.

Containment as appropriate.
Minimise number of staff exposed
Ensure segregation of worker from the source.
Containment in place
Provide extract ventilation to points where emissions occur.
Good standard of general ventilation.
Avoid contact with contaminated tools and objects.
Consider technical advances and process upgrades (including automation) for the elimination of re-leases.
Regular cleaning of equipment and work area.
Only properly trained and authorised personnel shall handle the substance.
Substance-handling procedures shall be well documented and supervised.
Assumes a good basic standard of occupational hygiene is implemented

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

The product is suspected of causing cancer.

Wear suitable protective clothing.

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Wear suitable gloves.
Wear suitable respiratory protection.
Use suitable eye protection.

For further specification, refer to section 8 of the SDS.

19.2.3. Control of worker exposure: Use as laboratory reagent (PROC15)

Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 100 %

Physical form of product : Liquid

Vapour pressure : 0.000346 Pa (25 °C)

Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

Use frequency : 220 days per year

Technical and organisational conditions and measures

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Only properly trained and authorised personnel shall handle the substance.
Substance-handling procedures shall be well documented and supervised.

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

The product is suspected of causing cancer.
The product is skin irritant.
Therefore, exposure should be minimised by appropriate risk management measures.
For general risk management measures, operational conditions and personal protective equipment to be considered when handling the substance or mixture, refer to the 'General measures applicable to all activities' section in this exposure scenario.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Dermal - minimum efficiency of 90 %

For further specification, refer to section 8 of the SDS.

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TRIBUTYL PHOSPHATE

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Country / Language: GB / EN(GB)

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use
Temperature : Covers use at ambient temperatures.

19.3. Exposure estimation and reference to its source

19.3.1. Environmental release and exposure: Use of intermediate; Use of reactive processing aid at industrial site (no inclusion into or onto article) (ERC6a, ERC6b)

Release route	Release	Release estimation method
Water	2 %	ESVOC SPERC 4.24.v1
Air	2.5 %	ESVOC SPERC 4.24.v1
Soil	0 %	ESVOC SPERC 4.24.v1

Compartment	Risk Characterisation Ratio (RCR)	Calculation method
All routes	< 1	ECETOC TRA

19.3.3. Worker exposure: Use as laboratory reagent (PROC15)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	systemic	< 1	ECETOC TRA
All routes	-	carcinogenic effects		Qualitative assessment

Additional information on exposure estimation

The product is suspected of causing cancer.
The product is skin irritant.
Available hazard data do not enable the derivation of a DNEL for carcinogenic and dermal irritant effects.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006



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19.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance to Downstream Users

Fulfilling the above conditions the downstream user is deemed to work safely inside the boundaries set by this exposure scenario.

Other conditions should only be considered if the downstream user implements or recommends an exposure scenario which includes as a minimum the conditions described in this exposure scenario.

The product is suspected of causing cancer.

Therefore, exposure should be minimised by appropriate risk management measures.