RHEOBYK-411

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

1.1 Product identifier

Trade name	:	RHEOBYK-411
UFI	:	5TQ3-30T1-100F-EADP
Product code	:	000000000000129986

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

Use of the Substance/Mixture	:	Rheology Additive

1.3 Details of the supplier of the safety data sheet

Company	:	BYK-Chemie GmbH Abelstrasse 45 46483 Wesel
Telephone	:	+49 281 670-0
Telefax	:	+49 281 65735
Information	:	Regulatory Affairs
Telephone	:	+49 281 670-23532
Telefax	:	+49 281 670-23533
E-mail address	:	GHS.BYK@altana.com

1.4 Emergency telephone number

+44 1235 239670

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Skin irritation, Category 2	H315: Causes skin irritation.
Eye irritation, Category 2	H319: Causes serious eye irritation.
Reproductive toxicity, Category 1B	H360D: May damage the unborn child.
Specific target organ toxicity - single exposure, Category 3, Respiratory system	H335: May cause respiratory irritation.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms :



Signal word : Danger

Hazard statements :

H315	Causes skin irritation.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H360D	May damage the unborn child.

Precautionary statements :

Prevention:

P201	Obtain special instructions before use.
P261	Avoid breathing mist or vapours.
P264	Wash skin thoroughly after handling.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.

Response:

P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.

Hazardous components which must be listed on the label:

- 872-50-4 N-methyl-2-pyrrolidone

Additional Labelling

Restricted to professional users.

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.

Ecological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Toxicological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Chemical nature : Solution of a modified urea

Components

Chemical name	CAS-No. EC-No. Index-No. Registration number	Classification	Concentration (% w/w)
N-methyl-2-pyrrolidone	872-50-4 212-828-1 01-2119472430-46	Skin Irrit. 2; H315 Eye Irrit. 2; H319 Repr. 1B; H360D STOT SE 3; H335 (Respiratory system) --- specific concentration limit STOT SE 3; H335 >= 10 %	>= 50 - <= 100
lithium chloride	7447-41-8 231-212-3 01-2119560574-35	Acute Tox. 4; H302 Skin Irrit. 2; H315 Eye Irrit. 2; H319 --- Acute toxicity estimate Acute oral toxicity: 526 mg/kg	>= 1 - < 3
Pyrrolidinone, dimethyl-	60544-40-3	Skin Irrit. 2; H315 Eye Irrit. 2; H319 Repr. 1B; H360 STOT SE 3; H335 (Respiratory system)	>= 0,3 - < 0,5

For explanation of abbreviations see section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice : Move out of dangerous area.
Show this safety data sheet to the doctor in attendance.
Do not leave the victim unattended.

If inhaled : If unconscious, place in recovery position and seek medical advice.
If symptoms persist, call a physician.

In case of skin contact : If skin irritation persists, call a physician.
If on skin, rinse well with water.
If on clothes, remove clothes.

In case of eye contact : Immediately flush eye(s) with plenty of water.
Remove contact lenses.
Protect unharmed eye.
Keep eye wide open while rinsing.

If eye irritation persists, consult a specialist.

If swallowed : Keep respiratory tract clear.
Do not give milk or alcoholic beverages.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.
Take victim immediately to hospital.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms : No information available.

Risks : Causes skin irritation.
Causes serious eye irritation.
May cause respiratory irritation.
May damage the unborn child.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment : No information available.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Carbon dioxide (CO2)

Foam
Carbon dioxide (CO2)
Dry chemical

Water mist

Unsuitable extinguishing media : High volume water jet

5.2 Special hazards arising from the substance or mixture

Hazardous combustion products : Carbon oxides
Nitrogen oxides (NOx)
Halogenated compounds
Metal oxides
Hydrogen chloride

5.3 Advice for firefighters

Special protective equipment for firefighters : Wear self-contained breathing apparatus for firefighting if necessary.

Further information : Standard procedure for chemical fires.
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Use personal protective equipment.

6.2 Environmental precautions

Environmental precautions : 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.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up : Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).
Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

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

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling : Avoid formation of aerosol.
Do not breathe vapours/dust.
Avoid contact with skin and eyes.
For personal protection see section 8.
Smoking, eating and drinking should be prohibited in the application area.
Provide sufficient air exchange and/or exhaust in work rooms.
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 : Keep container tightly closed in a dry and well-ventilated place. 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) : No data available

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

Components	CAS-No.	Value type (Form of exposure)	Control parameters	Basis
N-methyl-2-pyrrolidone	872-50-4	TWA	10 ppm 40 mg/m3	CH SUVA
	Further information: Substances that are likely to be toxic to reproduction, Toxic by skin resorption possible; Substances, which are easily absored through the skin, can give by additional skin resoption a substancial higher risk compared to only inhalation by the airways., National Institute of Research and Safety for the prevention of work accidents and occupational diseases, Harm to the unborn child is not to be expected when the OEL-value is respected			
		STEL	20 ppm 80 mg/m3	CH SUVA
	Further information: Substances that are likely to be toxic to reproduction, Toxic by skin resorption possible; Substances, which are easily absored through the skin, can give by additional skin resoption a substancial higher risk compared to only inhalation by the airways., National Institute of Research and Safety for the prevention of work accidents and occupational diseases, Harm to the unborn child is not to be expected when the OEL-value is respected			
		TWA	10 ppm 40 mg/m3	2009/161/EU
	Further information: Identifies the possibility of significant uptake through the skin, Indicative			
		STEL	20 ppm 80 mg/m3	2009/161/EU
	Further information: Identifies the possibility of significant uptake through the skin, Indicative			
		TWA	10 ppm 40 mg/m3	2004/37/EC
	Further information: Skin, Carcinogens or mutagens			
		STEL	20 ppm 80 mg/m3	2004/37/EC
	Further information: Skin, Carcinogens or mutagens			
lithium chloride	7447-41-8	TWA (inhalable dust)	0,2 mg/m3 (Lithium)	CH SUVA
	Further information: Occupational Safety and Health Administration, Harm to the unborn child is not to be expected when the OEL-value is respected			
		STEL (inhalable dust)	0,2 mg/m3 (Lithium)	CH SUVA
	Further information: Occupational Safety and Health Administration, Harm to the unborn child is not to be expected when the OEL-value is respected			

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

Substance name	End Use	Exposure routes	Potential health effects	Value

N-methyl-2-pyrrolidone	Workers	Inhalation	Long-term local effects	40 mg/m3
	Workers	Inhalation	Long-term systemic effects	14,4 mg/m3
	Workers	Skin contact	Long-term systemic effects	4,8 mg/kg
	Consumers	Inhalation	Long-term systemic effects	3,6 mg/m3
	Consumers	Inhalation	Long-term local effects	4,5 mg/m3
	Consumers	Ingestion	Long-term systemic effects	0,85 mg/kg
	Consumer use	Skin contact	Long-term systemic effects	2,4 mg/kg
Modified urea	Workers	Inhalation	Long-term systemic effects	59 mg/m3
	Workers	Dermal	Long-term systemic effects	8,3 mg/kg
	Consumers	Inhalation	Long-term systemic effects	15 mg/m3
	Consumers	Dermal	Long-term systemic effects	4,2 mg/kg
	Consumers	Oral	Long-term systemic effects	4,2 mg/kg
lithium chloride	Workers	Inhalation	Acute systemic effects	1,2 mg/m3
	Workers	Skin contact	Long-term systemic effects	9,9 mg/kg
	Workers	Inhalation	Long-term systemic effects	1,2 mg/m3
	Consumers	Inhalation	Long-term systemic effects	0,6 mg/m3
	Consumers	Skin contact	Long-term systemic effects	4,25 mg/kg
	Consumers	Ingestion	Long-term systemic effects	0,43 mg/kg
	Consumers	Inhalation	Acute systemic effects	0,6 mg/m3
	Consumers	Ingestion	Acute systemic effects	1,29 mg/kg
	Consumers	Inhalation	Long-term local effects	0,6 mg/m3

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

Substance name	Environmental Compartment	Value
N-methyl-2-pyrrolidone	Fresh water	0,25 mg/l
	Marine water	0,025 mg/l
	Fresh water sediment	1,09 mg/kg
	Marine sediment	0,109 mg/kg
	Soil	0,07 mg/kg
	Sewage treatment plant	10 mg/l
	Intermittent releases	5 mg/l

lithium chloride	Fresh water	2175 mg/l
	Fresh water sediment	56,54 mg/kg
	Marine water	217 mg/l
	Marine sediment	5,654 mg/kg
	Soil	10,44 mg/kg
	Sewage treatment plant	1,402 mg/l

8.2 Exposure controls

Personal protective equipment

Eye/face protection : Eye wash bottle with pure water
Tightly fitting safety goggles
Wear face-shield and protective suit for abnormal processing problems.

Hand protection
Material : butyl-rubber
Break through time : 120,00 min

Remarks : The suitability for a specific workplace should be discussed with the producers of the protective gloves.

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.

Environmental exposure controls

General advice : 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.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state : liquid

Colour : light yellow

Odour : not significant

Odour Threshold : No data available

Melting point/ range : < 0 °C
Method: derived

Initial boiling point : 203,00 °C
Method: derived

Upper explosion limit / Upper flammability limit : 9,50 %(V)

Lower explosion limit / Lower flammability limit	:	1,30 %(V)
Flash point	:	91,00 °C Method: 49 (Pensky-Martens)
Auto-ignition temperature	:	> 200 °C Method: M0062 (Analytics Wesel)
Decomposition temperature	:	No data available
pH	:	5 (20 °C) Concentration: 1 % Method: Universal pH-value indicator
Viscosity		
Viscosity, dynamic	:	No data available
Viscosity, kinematic	:	No data available
Solubility(ies)		
Water solubility	:	immiscible
Solubility in other solvents	:	No data available
Partition coefficient: n-octanol/water	:	No data available
Vapour pressure	:	< 0,5000000 hPa (20,00 °C) Method: derived
Relative density	:	No data available
Density	:	1,0500 g/cm3 (20,00 °C) Method: 4 (20°C oscillating U-tube)
Bulk density	:	Not applicable
Relative vapour density	:	No data available

9.2 Other information

Flammability (liquids)	:	Sustains combustion
Evaporation rate	:	No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
No decomposition if stored and applied as directed.

10.2 Chemical stability
No decomposition if stored and applied as directed.

10.3 Possibility of hazardous reactions
Hazardous reactions : No decomposition if stored and applied as directed.

10.4 Conditions to avoid
Conditions to avoid : No data available

10.5 Incompatible materials
Materials to avoid : Acids
Strong oxidizing agents
Alkalis

10.6 Hazardous decomposition products
No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity
Not classified due to lack of data.

Product:

Acute oral toxicity : Acute toxicity estimate: > 2.000 mg/kg
Method: Calculation method

Acute dermal toxicity : Remarks: No data available

Components:

N-methyl-2-pyrrolidone:

Acute oral toxicity : LD50 (Rat): 4.150 mg/kg
Method: OECD Test Guideline 401
GLP: no

Acute inhalation toxicity : LC50 (Rat): > 5,1 mg/l
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
GLP: yes

Acute dermal toxicity : LD50 (Rat): > 5.000 mg/kg
Method: OECD Test Guideline 402

GLP: No information available.

lithium chloride:

Acute oral toxicity	:	LD50 (Rat): 526 mg/kg GLP: No information available.
Acute inhalation toxicity	:	LC50 (Rat): > 5,57 mg/l Test atmosphere: dust/mist Method: OECD Test Guideline 403 GLP: yes
Acute dermal toxicity	:	LD50 (Rat): > 2.000 mg/kg Method: OECD Test Guideline 402 GLP: yes

Skin corrosion/irritation

Causes skin irritation.

Product:

Remarks	:	May irritate skin. May cause skin irritation in susceptible persons.

Components:

N-methyl-2-pyrrolidone:

Species	:	Rabbit
Method	:	OECD Test Guideline 404
Result	:	slight irritation
GLP	:	yes

Serious eye damage/eye irritation

Causes serious eye irritation.

Product:

Remarks	:	Causes serious eye irritation.

Components:

N-methyl-2-pyrrolidone:

Species	:	Rabbit
Method	:	OECD Test Guideline 405
Result	:	Severe eye irritation
GLP	:	no

lithium chloride:

Species	:	Rabbit
Method	:	OECD Test Guideline 405
Result	:	Severe eye irritation
GLP	:	yes

Respiratory or skin sensitisation

Skin sensitisation

Not classified due to lack of data.

Respiratory sensitisation

Not classified due to lack of data.

Product:

Remarks	:	No data available

Components:

N-methyl-2-pyrrolidone:

Test Type	:	Mouse Local Lymph Node assay (LLNA)
Exposure routes	:	Skin contact
Species	:	Mouse
Method	:	OECD Test Guideline 429
Result	:	Not a skin sensitizer.
GLP	:	yes

lithium chloride:

Test Type	:	Buehler Test
Exposure routes	:	Skin contact
Species	:	Guinea pig
Method	:	OECD Test Guideline 406
Result	:	Did not cause sensitisation on laboratory animals.
GLP	:	yes

Germ cell mutagenicity

Not classified due to lack of data.

Product:

Genotoxicity in vitro	:	Remarks: No data available
Genotoxicity in vivo	:	Remarks: No data available

Carcinogenicity

Not classified due to lack of data.

Product:

Remarks	:	No data available

Reproductive toxicity

May damage the unborn child.

Product:

Effects on fertility : Remarks: No data available

Effects on foetal development : Remarks: No data available

Reproductive toxicity - Assessment : May damage the unborn child.

STOT - single exposure

May cause respiratory irritation.

Product:

Remarks : No data available

STOT - repeated exposure

Not classified due to lack of data.

Product:

Remarks : No data available

Aspiration toxicity

Not classified due to lack of data.

Product:

No data available

11.2 Information on other hazards

Endocrine disrupting properties

Not classified due to lack of data.

Product:

Assessment : The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Further information

Product:

Remarks : No data available

SECTION 12: Ecological information

12.1 Toxicity

Product:

Toxicity to fish : Remarks: No data available

Toxicity to algae/aquatic plants : Remarks: No data available

Components:

N-methyl-2-pyrrolidone:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): > 500 mg/l
Exposure time: 96 h
Test Type: static test
GLP: no

Toxicity to algae/aquatic plants : (Scenedesmus subspicatus): > 500 mg/l
Exposure time: 72 h
GLP: no

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: 12,5 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)
Test Type: semi-static test
Method: OECD Test Guideline 211
GLP: yes

lithium chloride:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 158 mg/l
Exposure time: 96 h
Test Type: static test
Method: OECD Test Guideline 203
GLP: yes

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 249 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202
GLP: yes

NOEC (Daphnia magna (Water flea)): 63,4 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202
GLP: yes

Toxicity to algae/aquatic plants : (Desmodesmus subspicatus (green algae)): > 400 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201
GLP: yes

12.2 Persistence and degradability

Product:

Biodegradability : Remarks: No data available

Components:

N-methyl-2-pyrrolidone:

Biodegradability	:	Result: Readily biodegradable. Method: OECD Test Guideline 301C GLP: No information available.

12.3 Bioaccumulative potential

Product:

Bioaccumulation	:	Remarks: No data available

Components:

N-methyl-2-pyrrolidone:

Partition coefficient: n-octanol/water	:	log Pow: -0,46 (25 °C) Method: OECD Test Guideline 107 GLP: no

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 Endocrine disrupting properties

Product:

Assessment	:	The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

12.7 Other adverse effects

Product:

Additional ecological information	:	No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product	:	Do not dispose of waste into sewer.

		Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.
Contaminated packaging	:	Empty remaining contents. Dispose of as unused product. Do not re-use empty containers.

SECTION 14: Transport information

14.1 UN number or ID number

ADN	:	Not regulated as a dangerous good
ADR	:	Not regulated as a dangerous good
RID	:	Not regulated as a dangerous good
IMDG	:	Not regulated as a dangerous good
IATA	:	Not regulated as a dangerous good

14.2 UN proper shipping name

ADN	:	Not regulated as a dangerous good
ADR	:	Not regulated as a dangerous good
RID	:	Not regulated as a dangerous good
IMDG	:	Not regulated as a dangerous good
IATA	:	Not regulated as a dangerous good

14.3 Transport hazard class(es)

ADN	:	Not regulated as a dangerous good
ADR	:	Not regulated as a dangerous good
RID	:	Not regulated as a dangerous good
IMDG	:	Not regulated as a dangerous good
IATA	:	Not regulated as a dangerous good

14.4 Packing group

ADN	:	Not regulated as a dangerous good
ADR	:	Not regulated as a dangerous good
RID	:	Not regulated as a dangerous good
IMDG	:	Not regulated as a dangerous good
IATA (Cargo)	:	Not regulated as a dangerous good
IATA (Passenger)	:	Not regulated as a dangerous good

14.5 Environmental hazards

Not regulated as a dangerous good

14.6 Special precautions for user

Not applicable

14.7 Maritime transport in bulk according to IMO instruments

Not applicable for product as supplied.

SECTION 15: Regulatory information

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

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII)	:	Conditions of restriction for the following entries should be considered: Number on list 3 Number on list 30: N-methyl-2-pyrrolidone Number on list 71: N-methyl-2-pyrrolidone Number on list 72: N-methyl-2-pyrrolidone Number on list 75: If you intend to use this product as tattoo ink, please contact your vendor.
REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59).	:	N-methyl-2-pyrrolidone
REACH - List of substances subject to authorisation (Annex XIV)	:	Not applicable
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
Volatile organic compounds	:	Ordinance on the Incentive Tax on Volatile Organic Compounds (OVOC) Volatile organic compounds (VOC) content: 74,7 %

Other regulations:

The product belongs to group 1 according to the Swiss Chemicals Ordinance (ChemO 813.11).

15.2 Chemical safety assessment

Not applicable

SECTION 16: Other information

Items where relevant changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

Full text of H-Statements

H302	:	Harmful if swallowed.
H315	:	Causes skin irritation.
H319	:	Causes serious eye irritation.
H335	:	May cause respiratory irritation.
H360	:	May damage fertility or the unborn child.
H360D	:	May damage the unborn child.

Full text of other abbreviations

Acute Tox.	:	Acute toxicity
Eye Irrit.	:	Eye irritation
Repr.	:	Reproductive toxicity
Skin Irrit.	:	Skin irritation
STOT SE	:	Specific target organ toxicity - single exposure
2004/37/EC	:	Europe. Directive 2004/37/EC on the protection of workers from the risks related to exposure to carcinogens, mutagens or reprotoxic substances at work - Annex III
2009/161/EU	:	Europe. COMMISSION DIRECTIVE 2009/161/EU establishing a third list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC and amending Commission Directive 2000/39/EC
CH SUVA	:	Switzerland. Limit values at the work place
2004/37/EC / STEL	:	Short term exposure limit
2004/37/EC / TWA	:	Long term exposure limit
2009/161/EU / TWA	:	Limit Value - eight hours
2009/161/EU / STEL	:	Short term exposure limit
CH SUVA / TWA	:	Time Weighted Average
CH SUVA / STEL	:	Short Term Exposure Limit

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonised System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organisation; ISHL - Industrial Safety and Health Law (Japan); ISO -

International Organisation for Standardisation; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organisation for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - Substance of Very High Concern; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

Further information

Classification of the mixture:		**Classification procedure:**
Skin Irrit. 2	H315	Calculation method
Eye Irrit. 2	H319	Calculation method
Repr. 1B	H360D	Calculation method
STOT SE 3	H335	Calculation method

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

CH / EN

Annex: Exposure Scenarios

Table of Contents

Number	Title
ES 1	Formulation or re-packing; Industrial uses (SU3).
ES 2	Filling of equipment from drums or containers; Industrial uses (SU3).
ES 3	Processing aid; Industrial uses (SU3).
ES 4	Use in laboratories; Industrial uses (SU3).
ES 5	Use in coatings; Industrial uses (SU3).
ES 6	Use in cleaning agents; Industrial uses (SU3).
ES 7	Use in laboratories; Professional uses (SU22).

ES 1: Formulation or re-packing; Industrial uses (SU3).

1.1. Title section

Exposure Scenario name	:	Formulation & (re)packing of substances and mixtures
Structured Short Title	:	Formulation or re-packing; Industrial uses (SU3).

Environment		
CS 1	**Formulation of preparations**	ERC2
Worker		
CS 2	**Use in closed batch process (synthesis or formulation)**	PROC3
CS 3	**Use in closed batch process (synthesis or formulation)**	PROC3
CS 4	**Use in batch and other process (synthesis) where opportunity for exposure arises**	PROC4
CS 5	**Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact)**	PROC5

1.2. Conditions of use affecting exposure

1.2.1. Control of environmental exposure: Formulation of preparations (ERC2)

Product (article) characteristics		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount used in the EU	:	7610000 kg
Maximum allowable site tonnage (MSafe)	:	8.404.500 kg
Release type	:	Continuous release
Emission days	:	300
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP sludge treatment	:	No application of sewage sludge to soil Can be incinerated, when in compliance with local regulations.

Other conditions affecting environmental exposure		
Local freshwater dilution factor	:	187,61
Local marine water dilution factor	:	1.876,07

1.2.2. Control of worker exposure: Use in closed batch process (synthesis or formulation) (PROC3)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	32 Pa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	480 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Inhalation - minimum efficiency of 30 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374. Use suitable eye protection.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Ventilation rate per hour	:	3

1.2.3. Control of worker exposure: Use in closed batch process (synthesis or formulation) (PROC3)

Product (article) characteristics
Covers concentrations up to 100 %

Physical form of product	:	Liquid
Vapour pressure	:	100 hPa
Temperature	:	100 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	480 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of 80 %		
Use suitable eye protection.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use

1.2.4. Control of worker exposure: Use in batch and other process (synthesis) where opportunity for exposure arises (PROC4)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	32 Pa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	480 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Provide a good standard of controlled ventilation (10 to 15 air changes per hour). Inhalation - minimum efficiency of 70 %		

Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of 80 %		
Use suitable eye protection.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use

1.2.5. Control of worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) (PROC5)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	100 hPa
Temperature	:	100 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Provide a good standard of controlled ventilation (5 to 10 air changes per hour). Inhalation - minimum efficiency of 30 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training. Dermal - minimum efficiency of 90 %		
Use suitable eye protection.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use

1.3. Exposure estimation and reference to its source

1.3.1. Environmental release and exposure: Formulation of preparations (ERC2)

Protection Target	Exposure estimate	RCR
Sewage treatment plant	(ECETOC TRA environment v3)	0,003

1.3.2. Worker exposure: Use in closed batch process (synthesis or formulation) (PROC3)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0,686 mg/kg bw/day (ECETOC TRA worker v3)	0,143
inhalative	systemic	long-term	8,674 mg/m³ (ECETOC TRA worker v3)	0,602
inhalative	local	long-term	8,674 mg/m³ (ECETOC TRA worker v3)	0,217

1.3.3. Worker exposure: Use in closed batch process (synthesis or formulation) (PROC3)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0,137 mg/kg bw/day (ECETOC TRA worker v3)	0,029
inhalative	systemic	long-term	4,131 mg/m³ (ECETOC TRA worker v3)	0,287
inhalative	local	long-term	4,131 mg/m³ (ECETOC TRA worker v3)	0,103

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	1,371 mg/kg	0,286

			bw/day (ECETOC TRA worker v3)	
inhalative	systemic	long-term	6,196 mg/m³ (ECETOC TRA worker v3)	0,430
inhalative	local	long-term	6,196 mg/m³ (ECETOC TRA worker v3)	0,155

1.3.5. Worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) (PROC5)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0,823 mg/kg bw/day (ECETOC TRA worker v3)	0,171
inhalative	systemic	long-term	8,674 mg/m³ (ECETOC TRA worker v3)	0,602
inhalative	local	long-term	14,457 mg/m³ (ECETOC TRA worker v3)	0,361

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

For scaling see
http://www.ecetoc.org/tra

ES 2: Filling of equipment from drums or containers; Industrial uses (SU3).

2.1. Title section

Exposure Scenario name	:	Filling of equipment from drums or containers
Structured Short Title	:	Filling of equipment from drums or containers; Industrial uses (SU3).

Environment		
CS 1	**Formulation of preparations**	ERC2
Worker		
CS 2	**Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities**	PROC8a
CS 3	**Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities**	PROC8b
CS 4	**Transfer of substance or mixture into small containers (dedicated filling line, including weighing)**	PROC9
CS 5	**Use as laboratory reagent**	PROC15

2.2. Conditions of use affecting exposure

2.2.1. Control of environmental exposure: Formulation of preparations (ERC2)

2.2.2. Control of worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities (PROC8a)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,32 hPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	480 min
Use frequency	:	5 days/week

Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %		
Use suitable eye protection.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use

2.2.3. Control of worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities (PROC8b)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,32 hPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	480 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Provide a good standard of controlled ventilation (5 to 10 air changes per hour). Inhalation - minimum efficiency of 70 %		
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %		
Use suitable eye protection.		
Other conditions affecting workers exposure		

Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use

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

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,32 hPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	480 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Provide a good standard of controlled ventilation (5 to 10 air changes per hour). Inhalation - minimum efficiency of 70 %		
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of 80 %		
Use suitable eye protection.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use

2.2.5. Control of worker exposure: Use as laboratory reagent (PROC15)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,32 hPa

Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	480 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of 80 %		
Use suitable eye protection.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor

2.3. Exposure estimation and reference to its source

2.3.1. Environmental release and exposure: Formulation of preparations (ERC2)

Additional information on exposure estimation
No exposure assessment presented for the environment.

2.3.2. Worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities (PROC8a)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	1,37 mg/kg bw/day (ECETOC TRA worker v3)	0,286
inhalative	systemic	long-term	4,131 mg/m³ (ECETOC TRA worker v3)	0,287
inhalative	local	long-term	4,131 mg/m³ (ECETOC TRA worker v3)	0,103

2.3.3. Worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities (PROC8b)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	1,37 mg/kg bw/day (ECETOC TRA worker v3)	0,286
inhalative	systemic	long-term	6,20 mg/m³ (ECETOC TRA worker v3)	0,430
inhalative	local	long-term	6,20 mg/m³ (ECETOC TRA worker v3)	0,155

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	1,37 mg/kg bw/day (ECETOC TRA worker v3)	0,286
inhalative	systemic	long-term	6,20 mg/m³ (ECETOC TRA worker v3)	0,430
inhalative	local	long-term	6,20 mg/m³ (ECETOC TRA worker v3)	0,155

2.3.5. Worker exposure: Use as laboratory reagent (PROC15)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0,069 mg/kg bw/day (ECETOC TRA worker v3)	0,014
inhalative	systemic	long-term	2,065 mg/m³ (ECETOC TRA worker v3)	0,143
inhalative	local	long-term	2,065 mg/m³ (ECETOC TRA worker v3)	0,051

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

For scaling see
http://www.ecetoc.org/tra

ES 3: Processing aid; Industrial uses (SU3).

3.1. Title section

Exposure Scenario name	:	Processing aid
Structured Short Title	:	Processing aid; Industrial uses (SU3).

Environment		
CS 1	**Industrial use of processing aids in processes and products, not becoming part of articles**	ERC4
Worker		
CS 2	**Use in closed process, no likelihood of exposure**	PROC1
CS 3	**Use in closed, continuous process with occasional controlled exposure**	PROC2
CS 4	**Use in closed batch process (synthesis or formulation)**	PROC3
CS 5	**Chemical production where opportunity for exposure arises**	PROC4

3.2. Conditions of use affecting exposure

3.2.1. Control of environmental exposure: Industrial use of processing aids in processes and products, not becoming part of articles (ERC4)

Product (article) characteristics		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount used in the EU	:	2001000 kg
Release type	:	Continuous release
Emission days	:	300
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP effluent	:	2.000 m3/d
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 in closed process, no likelihood of exposure (PROC1)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,32 hPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	480 min
Use frequency	:	5 days/week
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor

3.2.3. Control of worker exposure: Use in closed, continuous process with occasional controlled exposure (PROC2)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,32 hPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	480 min
Use frequency	:	5 days/week
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Use suitable eye protection.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor

3.2.4. Control of worker exposure: Use in closed batch process (synthesis or formulation) (PROC3)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,32 hPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	480 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Inhalation - minimum efficiency of 30 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Use eye protection according to EN 166.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor

3.2.5. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,32 hPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	480 min

Use frequency	: 5 days/week
Technical and organisational conditions and measures	
Provide a good standard of controlled ventilation (5 to 10 air changes per hour). Inhalation - minimum efficiency of 70 %	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of 80 %	
Use suitable eye protection.	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor

3.3. Exposure estimation and reference to its source

3.3.1. Environmental release and exposure: Industrial use of processing aids in processes and products, not becoming part of articles (ERC4)

Protection Target	Exposure estimate	RCR
Sewage treatment plant	(ECETOC TRA environment v3)	0,267

3.3.2. Worker exposure: Use in closed process, no likelihood of exposure (PROC1)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0,034 (ECETOC TRA worker v3)	0,007
inhalative	systemic	long-term	0,041 (ECETOC TRA worker v3)	0,003
inhalative	local	long-term	0,041 (ECETOC TRA worker v3)	0,001

3.3.3. Worker exposure: Use in closed, continuous process with occasional controlled exposure (PROC2)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	1,371 mg/kg	0,286

			bw/day (ECETOC TRA worker v3)	
inhalative	systemic	long-term	4,131 mg/m³ (ECETOC TRA worker v3)	0,287
inhalative	local	long-term	4,131 mg/m³ (ECETOC TRA worker v3)	0,103

3.3.4. Worker exposure: Use in closed batch process (synthesis or formulation) (PROC3)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0,686 mg/kg bw/day (ECETOC TRA worker v3)	0,143
inhalative	systemic	long-term	8,674 mg/m³ (ECETOC TRA worker v3)	0,602
inhalative	local	long-term	8,674 mg/m³ (ECETOC TRA worker v3)	0,217

3.3.5. Worker exposure: Chemical production where opportunity for exposure arises (PROC4)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	1,371 mg/kg bw/day (ECETOC TRA worker v3)	0,286
inhalative	systemic	long-term	6,196 mg/m³ (ECETOC TRA worker v3)	0,430
inhalative	local	long-term	6,196 mg/m³ (ECETOC TRA worker v3)	0,155

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

For scaling see
http://www.ecetoc.org/tra

ES 4: Use in laboratories; Industrial uses (SU3).

4.1. Title section

Exposure Scenario name	:	Laboratory activities
Structured Short Title	:	Use in laboratories; Industrial uses (SU3).

Environment		
CS 1	**Use of non-reactive processing aid at industrial site (no inclusion into or onto article)**	ERC4
Worker		
CS 2	**Use as laboratory reagent**	PROC15

4.2. Conditions of use affecting exposure

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

Product (article) characteristics		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount used in the EU	:	1000 kg
Maximum allowable site tonnage (MSafe)	:	250,1 kg
Release type	:	Continuous release
Emission days	:	20
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal Sewage Treatment Plant
STP effluent	:	2.000 m3/d
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	Distillation of used process solvent
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: Use as laboratory reagent (PROC15)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,32 hPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	480 min
Use frequency	:	5 days per week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of 80 %		
Use suitable eye protection.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

4.3. Exposure estimation and reference to its source

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

Protection Target	Exposure estimate	RCR
wastewater treatment plant microbes	(ECETOC TRA environment v3)	0,200

4.3.2. Worker exposure: Use as laboratory reagent (PROC15)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0,069 mg/kg bw/day (ECETOC TRA worker v3)	0,014
inhalative	systemic	long-term	2,065 mg/m³ (ECETOC TRA worker v3)	0,143
inhalative	systemic	long-term	2,065 mg/m³ (ECETOC TRA worker v3)	0,052

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

For scaling see
http://www.ecetoc.org/tra

ES 5: Use in coatings; Industrial uses (SU3).

5.1. Title section

Exposure Scenario name	:	Use in coatings
Structured Short Title	:	Use in coatings; Industrial uses (SU3).

Environment		
CS 1	**Industrial use of processing aids in processes and products, not becoming part of articles**	ERC4
Worker		
CS 2	**Industrial spraying**	PROC7
CS 3	**Roller application or brushing**	PROC10
CS 4	**Treatment of articles by dipping and pouring**	PROC13

5.2. Conditions of use affecting exposure

5.2.1. Control of environmental exposure: Industrial use of processing aids in processes and products, not becoming part of articles (ERC4)

Product (article) characteristics		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount used in the EU	:	350000 kg
Maximum allowable site tonnage (MSafe)	:	12.506,7 kg
Release type	:	Continuous release
Emission days	:	300
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP effluent	:	2.000 m3/d
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	Distillation of used process solvent

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: Industrial spraying (PROC7)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	32 Pa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	480 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 95 %		
Provide a good standard of controlled ventilation (5 to 10 air changes per hour). Inhalation - minimum efficiency of 70 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %		
Use suitable eye protection.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Ensure that the direction of airflow is clearly away from the worker. Ensure that direction of application is only horizontal or downward.		

5.2.3. Control of worker exposure: Roller application or brushing (PROC10)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	32 Pa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	480 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %		
Use suitable eye protection.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

5.2.4. Control of worker exposure: Treatment of articles by dipping and pouring (PROC13)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	32 Pa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	480 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation		

Inhalation - minimum efficiency of 90 %
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of 80 %
Use suitable eye protection.
Other conditions affecting workers exposure
Indoor or outdoor use : Indoor use

5.3. Exposure estimation and reference to its source

5.3.1. Environmental release and exposure: Industrial use of processing aids in processes and products, not becoming part of articles (ERC4)

Protection Target	Exposure estimate	RCR
wastewater treatment plant microbes	(ECETOC TRA environment v3)	0,093

5.3.2. Worker exposure: Industrial spraying (PROC7)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	2,142 mg/kg bw/day (ECETOC TRA worker v3)	0,446
inhalative	systemic	long-term	1 mg/m³ (ECETOC TRA worker v3)	0,069
inhalative	local	long-term	1 mg/m³ (ECETOC TRA worker v3)	0,025

5.3.3. Worker exposure: Roller application or brushing (PROC10)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	1,371 mg/kg bw/day (ECETOC TRA worker v3)	0,286
inhalative	systemic	long-term	4,131 mg/m³ (ECETOC TRA	0,287

			worker v3)	
inhalative	local	long-term	4,131 mg/m³ (ECETOC TRA worker v3)	0,103

5.3.4. Worker exposure: Treatment of articles by dipping and pouring (PROC13)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	2,743 mg/kg bw/day (ECETOC TRA worker v3)	0,571
inhalative	systemic	long-term	4,130 mg/m³ (ECETOC TRA worker v3)	0,286
inhalative	local	long-term	4,130 mg/m³ (ECETOC TRA worker v3)	0,103

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

For scaling see
http://www.ecetoc.org/tra

ES 6: Use in cleaning agents; Industrial uses (SU3).

6.1. Title section

Exposure Scenario name	:	Cleaning
Structured Short Title	:	Use in cleaning agents; Industrial uses (SU3).

Environment		
CS 1	**Industrial use of processing aids in processes and products, not becoming part of articles**	ERC4
Worker		
CS 2	**Industrial spraying**	PROC7
CS 3	**Industrial spraying**	PROC7
CS 4	**Roller application or brushing**	PROC10
CS 5	**Treatment of articles by dipping and pouring**	PROC13
CS 6	**Treatment of articles by dipping and pouring**	PROC13

6.2. Conditions of use affecting exposure

6.2.1. Control of environmental exposure: Industrial use of processing aids in processes and products, not becoming part of articles (ERC4)

Product (article) characteristics		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount used in the EU	:	1046000 kg
Maximum allowable site tonnage (MSafe)	:	20.963.000 kg
Release type	:	Continuous release
Emission days	:	20
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal Sewage Treatment Plant
STP effluent	:	2.000 m3/d

Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	Distillation of used process solvent
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: Industrial spraying (PROC7)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	32 Pa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	480 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 95 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %		
Use suitable eye protection.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Ensure that direction of application is only horizontal or downward. Ensure that the direction of airflow is clearly away from the worker.		

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

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	32 Pa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	480 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 95 %		
Provide a good standard of controlled ventilation (5 to 10 air changes per hour). Inhalation - minimum efficiency of 70 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %		
Use suitable eye protection.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Ensure that direction of application is only horizontal or downward. Ensure that the direction of airflow is clearly away from the worker.		

6.2.4. Control of worker exposure: Roller application or brushing (PROC10)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	32 Pa

Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	480 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %		
Wear suitable respiratory protection.		
Use suitable eye protection.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

6.2.5. Control of worker exposure: Treatment of articles by dipping and pouring (PROC13)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	32 Pa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	480 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.		

Dermal - minimum efficiency of 90 %		
Wear suitable coveralls to prevent exposure to the skin. Wear suitable respiratory protection.		
Use suitable eye protection.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

6.2.6. Control of worker exposure: Treatment of articles by dipping and pouring (PROC13)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	20000 Pa
Temperature	:	140 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training. Inhalation - minimum efficiency of 90 %		
Use suitable eye protection.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

6.3. Exposure estimation and reference to its source

6.3.1. Environmental release and exposure: Industrial use of processing aids in processes and products, not becoming part of articles (ERC4)

Protection Target	Exposure estimate	RCR
wastewater treatment plant microbes	(ECETOC TRA environment v3)	0,002

6.3.2. Worker exposure: Industrial spraying (PROC7)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	2,143 mg/kg bw/day (ECETOC TRA worker v3)	0,446
inhalative	systemic	long-term	7,1 mg/m³	0,493
inhalative	local	long-term	7,1 mg/m³	0,178

6.3.3. Worker exposure: Industrial spraying (PROC7)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	2,143 mg/kg bw/day (ECETOC TRA worker v3)	0,446
inhalative	systemic	long-term	1 mg/m³	0,069
inhalative	local	long-term	1 mg/m³	0,025

6.3.4. Worker exposure: Roller application or brushing (PROC10)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	2,743 mg/kg bw/day (ECETOC TRA worker v3)	0,571
inhalative	systemic	long-term	4,131 mg/m³ (ECETOC TRA worker v3)	0,287
inhalative	local	long-term	4,131 mg/m³ (ECETOC TRA	0,103

			worker v3)	

6.3.5. Worker exposure: Treatment of articles by dipping and pouring (PROC13)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	1,371 mg/kg bw/day (ECETOC TRA worker v3)	0,286
inhalative	systemic	long-term	4,131 mg/m³ (ECETOC TRA worker v3)	0,287
inhalative	local	long-term	4,131 mg/m³ (ECETOC TRA worker v3)	0,103

6.3.6. Worker exposure: Treatment of articles by dipping and pouring (PROC13)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0,823 mg/kg bw/day (ECETOC TRA worker v3)	0,171
inhalative	systemic	long-term	6,196 mg/m³ (ECETOC TRA worker v3)	0,430
inhalative	local	long-term	10,326 mg/m³ (ECETOC TRA worker v3)	0,258

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

For scaling see
http://www.ecetoc.org/tra

ES 7: Use in laboratories; Professional uses (SU22).

7.1. Title section

Exposure Scenario name	:	Laboratory activities
Structured Short Title	:	Use in laboratories; Professional uses (SU22).

Environment		
CS 1	**Wide dispersive indoor use of reactive substances in open systems**	ERC8b
Worker		
CS 2	**Use as laboratory reagent**	PROC15

7.2. Conditions of use affecting exposure

7.2.1. Control of environmental exposure: Wide dispersive indoor use of reactive substances in open systems (ERC8b)

Product (article) characteristics		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount used in the EU	:	1000 kg
Maximum allowable site tonnage (MSafe)	:	2,3 kg
Release type	:	Continuous release
Emission days	:	365
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal Sewage Treatment Plant
STP effluent	:	2.000 m3/d
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: Use as laboratory reagent (PROC15)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	32 Pa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	480 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Provide a good standard of controlled ventilation (5 to 10 air changes per hour). Inhalation - minimum efficiency of 70 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of 80 %		
Use suitable eye protection.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

7.3. Exposure estimation and reference to its source

7.3.1. Environmental release and exposure: Wide dispersive indoor use of reactive substances in open systems (ERC8b)

Protection Target	Exposure estimate	RCR
wastewater treatment plant microbes	(ECETOC TRA environment v3)	0,002

7.3.2. Worker exposure: Use as laboratory reagent (PROC15)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR

dermal	systemic	long-term	0,069 mg/kg bw/day (ECETOC TRA worker v3)	0,014
inhalative	systemic	long-term	6,196 mg/m³ (ECETOC TRA worker v3)	0,430
inhalative	local	long-term	6,196 mg/m³ (ECETOC TRA worker v3)	0,154

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

For scaling see
http://www.ecetoc.org/tra