ARALDITE® LY 3585 CH

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

1.1 Product identifier

Trade name	:	ARALDITE® LY 3585 CH
REACH Registration Number	:	01-2119456619-26
Substance name	:	2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane
CAS-No.	:	1675-54-3
EC-No.	:	216-823-5

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

Use of the Substance/Mixture	:	Epoxy resin solution

ES1: Manufacture of substance.
ES2: Formulation and (re)packing.
ES3: Use at industrial sites:, Monomers
ES4: Use at industrial sites:, Use as an intermediate.
ES5: Use at industrial sites:, Industrial application of coatings and inks
ES6: Use at industrial sites:, Use of lubricants in high energy open processes.
ES7: Professional application of coatings and inks
ES8: Consumer use

1.3 Details of the supplier of the safety data sheet

Company	:	Huntsman Advanced Materials (Europe) BV
Address	:	Everslaan 45 3078 Everberg Belgium
Telephone	:	+41 61 299 20 41
Telefax	:	+41 61 299 20 40
E-mail address of person responsible for the SDS	:	Global_Product_EHS_AdMat@huntsman.com

1.4 Emergency telephone number

Emergency telephone number	:	Centres Antipoison et de Toxicovigilance: ANGERS: 02 41 48 21 21 BORDEAUX: 05 56 96 40 80 LILLE: 0 825 812 822 LYON: 04 72 11 69 11 MARSEILLE 04 91 75 25 25 NANCY: 03 83 32 36 36 PARIS: 01 40 05 48 48 RENNES: 02 99 59 22 22 STRASBOURG: 03 88 37 37 37 TOULOUSE: 05 61 77 74 47 EUROPE: +32 35 75 1234 France ORFILA: +33(0)145425959

ASIA: +65 6336-6011
China: +86 20 39377888
+86 532 83889090
India: + 91 22 42 87 5333
Australia: 1800 786 152
New Zealand: 0800 767 437
USA: +1 800-424-9300

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.
Skin sensitisation, Category 1	H317: May cause an allergic skin reaction.
Long-term (chronic) aquatic hazard, Category 2	H411: Toxic to aquatic life with long lasting effects.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms :



Signal word : Warning

Hazard statements :
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H411 Toxic to aquatic life with long lasting effects.

Precautionary statements :

Prevention:
P261 Avoid breathing mist or vapours.
P264 Wash skin thoroughly after handling.
P273 Avoid release to the environment.
P280 Wear protective gloves/ eye protection/ face protection.

Response:
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P391 Collect spillage.

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

3.1 Substances

Substance name : 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane

EC-No. : 216-823-5

Hazardous components

Chemical name	CAS-No. EC-No.	Concentration (% w/w)	M-Factor, SCL, ATE
2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	1675-54-3 216-823-5	>= 90 - <= 100	specific concentration limit Skin Irrit. 2; H315 >= 5 % Eye Irrit. 2; H319 >= 5 %

Both 25068-38-6 and 1675-54-3 can be used to describe the epoxy resin which is produced through the reaction of bisphenol A and epichlorohydrin

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.
Treat symptomatically.
Get medical attention if symptoms occur.

Protection of first-aiders : First Aid responders should pay attention to self-protection and use the recommended protective clothing
If potential for exposure exists refer to Section 8 for specific personal protective equipment.
Avoid inhalation, ingestion and contact with skin and eyes.
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 inhaled, remove to fresh air. Get medical attention if symptoms occur.
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. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.
If swallowed	:	Keep respiratory tract clear. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician.

4.2 Most important symptoms and effects, both acute and delayed

Risks	:	Causes skin irritation. May cause an allergic skin reaction. Causes serious eye irritation.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment	:	Treat symptomatically.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media	:	Water spray Alcohol-resistant foam Carbon dioxide (CO2) Dry chemical
Unsuitable extinguishing media	:	Exercise caution when using a high volume water jet as it may scatter and spread fire

5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting	:	Do not allow run-off from fire fighting to enter drains or water courses.
Hazardous combustion products	:	Carbon oxides Halogenated compounds

5.3 Advice for firefighters

Special protective equipment for firefighters	:	Wear self-contained breathing apparatus for firefighting if necessary.
Specific extinguishing methods	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

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 : Use personal protective equipment.
Refer to protective measures listed in sections 7 and 8.

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., See Section 1 for emergency contact information., For personal protection see section 8.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling : Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitisation of susceptible persons.
Persons suffering from asthma, eczema or skin problems should avoid contact, including dermal contact, with this product.
Do not breathe vapours/dust.
Avoid exposure - obtain special instructions before use.
Avoid contact with skin and eyes.
For personal protection see section 8.
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 : Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Keep in properly labelled containers.

Advice on common storage : For incompatible materials please refer to Section 10 of this SDS.

Further information on storage stability : Stable under normal conditions.

Recommended storage temperature : 2 - 40 °C

7.3 Specific end use(s)

Specific use(s) : See Annex to the Safety data sheet for additional information in the Exposure Scenario(s).

No data available

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Contains no substances with occupational exposure limit values.

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

Substance name	End Use	Exposure routes	Potential health effects	Value
2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	Workers	Inhalation	Long-term systemic effects	4,93 mg/m3
	Workers	Dermal	Long-term systemic effects	0,75 mg/kg bw/day
	Consumers	Inhalation	Long-term systemic effects	0,87 mg/m3
	Consumers	Dermal	Long-term systemic effects	0,0893 mg/kg bw/day
	Consumers	Oral	Long-term systemic effects	0,5 mg/kg bw/day

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

Substance name	Environmental Compartment	Value
2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	Fresh water	0,006 mg/l
	Marine water	0,001 mg/l
	Fresh water sediment	0,341 mg/kg dry

		weight (d.w.)
	Marine sediment	0,034 mg/kg dry weight (d.w.)
	Soil	0,065 mg/kg dry weight (d.w.)
	Sewage treatment plant	10 mg/l
	Secondary Poisoning	11 mg/kg

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 : > 8 h

Material : Nitrile rubber
Break through time : 10 - 480 min

Material : Ethyl Vinyl Alcohol Laminate (EVAL)
Break through time : > 8 h

Remarks : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. The suitability for a specific workplace should be discussed with the producers of the protective gloves.
The selected protective gloves have to satisfy the specifications of Regulation (EU) 2016/425 and the standard EN 374 derived from it. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough. Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact).

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 : Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines
Equipment should conform to EN 14387

Filter type : Combined particulates and organic vapour type (A-P)

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	:	liquid
Colour	:	light yellow
Odour	:	slight
Odour Threshold	:	No data is available on the product itself.
Melting point/freezing point	:	No data is available on the product itself.
Boiling point	:	No data is available on the product itself.
Flammability (solid, gas)	:	No data is available on the product itself.
Lower explosion limit / Lower flammability limit	:	No data is available on the product itself.
Upper explosion limit / Upper flammability limit	:	No data is available on the product itself.
Flash point	:	> 200 °C Method: Pensky-Martens closed cup
Auto-ignition temperature	:	No data is available on the product itself.
Decomposition temperature	:	> 200 °C
pH	:	ca. 7 (20 °C) Concentration: 500 g/l
Viscosity		
Viscosity, dynamic	:	6 500 - 9 000 mPa.s (25 °C)
Solubility(ies)		
Water solubility	:	No data is available on the product itself.
Solubility in other solvents	:	No data is available on the product itself.
Partition coefficient: n-octanol/water	:	No data is available on the product itself.
Vapour pressure	:	< 0,0001 hPa (20 °C)
Density	:	1,15 - 1,2 g/cm3 (25 °C)

Relative density	:	No data is available on the product itself.
Relative vapour density	:	No data is available on the product itself.
Particle characteristics	:	No data is available on the product itself.

9.2 Other information

No data is available on the product itself.

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	:	No hazards to be specially mentioned.

10.4 Conditions to avoid

Conditions to avoid	:	None known.

10.5 Incompatible materials

Materials to avoid	:	None known.

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.

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Acute oral toxicity	:	LD50 (Rat, female): > 2 000 mg/kg Method: OECD Test Guideline 420 Assessment: The substance or mixture has no acute oral toxicity Remarks: No mortality observed at this dose.
Acute dermal toxicity	:	LD50 (Rat, male and female): > 2 000 mg/kg Method: OECD Test Guideline 402 Assessment: The substance or mixture has no acute dermal toxicity

Skin corrosion/irritation

Causes skin irritation.

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Species	:	Rabbit
Exposure time	:	4 h
Assessment	:	Irritating to skin.
Method	:	OECD Test Guideline 404
Result	:	Irritating to skin.

Serious eye damage/eye irritation

Causes serious eye irritation.

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Species	:	Rabbit
Assessment	:	Irritating to eyes.
Method	:	OECD Test Guideline 405
Result	:	Irritating to eyes.

Respiratory or skin sensitisation

Skin sensitisation

May cause an allergic skin reaction.

Respiratory sensitisation

Not classified due to lack of data.

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Test Type	:	Local lymph node assay (LLNA)
Exposure routes	:	Skin
Species	:	Mouse
Method	:	OECD Test Guideline 429
Result	:	The product is a skin sensitiser, sub-category 1B.

Germ cell mutagenicity

Not classified due to lack of data.

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Genotoxicity in vitro	:	Test Type: In vitro mammalian cell gene mutation test Test system: mouse lymphoma cells Metabolic activation: without metabolic activation Result: positive Test Type: reverse mutation assay Test system: Salmonella typhimurium Metabolic activation: with and without metabolic activation Method: Mutagenicity (Salmonella typhimurium - reverse mutation assay)

Result: negative

Genotoxicity in vivo : Test Type: in vivo assay
Species: Mouse (male)
Cell type: Germ
Application Route: Oral
Dose: 3333, 10000 mg/kg
Result: negative

Test Type: gene mutation test
Species: Rat (male)
Cell type: Somatic
Application Route: Oral
Dose: 50,250,500,1000 mg/kg bw/day
Method: OECD Test Guideline 488
Result: negative

Carcinogenicity

Not classified due to lack of data.

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Species	:	Rat, male
Application Route	:	Oral
Exposure time	:	24 month(s)
Dose	:	0, 2, 15, or 100 mg/kg bw/day
Frequency of Treatment	:	7 days/week
NOAEL	:	15 mg/kg bw/day
Method	:	OECD Test Guideline 453
Result	:	negative
Target Organs	:	Digestive organs

Species	:	Mouse, male
Application Route	:	Dermal
Exposure time	:	24 month(s)
Dose	:	0, 0.1, 10, 100 mg/kg bw/day
Frequency of Treatment	:	3 days/week
NOEL	:	0,1 mg/kg body weight
Method	:	OECD Test Guideline 453
Result	:	negative
Target Organs	:	Digestive organs

Species	:	Rat, female
Application Route	:	Dermal
Exposure time	:	24 month(s)
Dose	:	0.1, 100, 1000 mg/kg bw/day
Frequency of Treatment	:	5 days/week
NOEL	:	100 mg/kg body weight
Method	:	OECD Test Guideline 453
Result	:	negative

Species	:	Rat, female
Application Route	:	Oral
Exposure time	:	24 month(s)

Dose	:	0, 2, 15, or 100 mg/kg bw/day
Frequency of Treatment	:	7 days/week
NOAEL	:	100 mg/kg bw/day
Method	:	OECD Test Guideline 453
Result	:	negative
Target Organs	:	Digestive organs

Species	:	Rat, females
Application Route	:	Oral
Exposure time	:	24 month(s)
Dose	:	0, 2, 15, or 100 mg/kg bw/day
Frequency of Treatment	:	7 days/week
NOEL	:	2 mg/kg bw/day
Method	:	OECD Test Guideline 453
Result	:	negative
Target Organs	:	Digestive organs

Reproductive toxicity

Not classified due to lack of data.

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Effects on fertility	:	Test Type: Two-generation study Species: Rat, male and female Application Route: Oral Dose: 0, 50, 180, 540 or 750 milligram per kilogram Duration of Single Treatment: 238 d Frequency of Treatment: 1 daily General Toxicity - Parent: NOEL: 540 mg/kg body weight General Toxicity F1: NOEL: 750 mg/kg body weight Symptoms: No adverse effects Method: OECD Test Guideline 416 Result: No effects on fertility and early embryonic development were detected.
Effects on foetal development	:	Species: Rabbit, female Application Route: Dermal Dose: 0, 30, 100 or 300 milligram per kilogram Duration of Single Treatment: 28 d Frequency of Treatment: 1 daily General Toxicity Maternal: NOAEL: 30 mg/kg body weight Developmental Toxicity: NOAEL: 300 mg/kg body weight Method: Other guidelines Result: No teratogenic effects Test Type: Pre-natal Species: Rabbit, female Application Route: Oral Dose: 0, 20, 60 or 180 milligram per kilogram Duration of Single Treatment: 13 d Frequency of Treatment: 1 daily General Toxicity Maternal: NOAEL: 60 mg/kg body weight Developmental Toxicity: NOAEL: 180 mg/kg body weight Method: OECD Test Guideline 414

Result: No teratogenic effects

Test Type: Pre-natal
Species: Rat, female
Application Route: Oral
Dose: 0, 60, 180 and 540 milligram per kilogram
Duration of Single Treatment: 10 d
Frequency of Treatment: 1 daily
General Toxicity Maternal: NOAEL: 180 mg/kg body weight
Developmental Toxicity: NOAEL: > 540 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

STOT - single exposure

Not classified due to lack of data.

STOT - repeated exposure

Not classified due to lack of data.

Repeated dose toxicity

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Species	:	Rat, male and female
NOAEL	:	50 mg/kg
Application Route	:	oral (gavage)
Exposure time	:	14 Weeks
Number of exposures	:	7 d
Dose	:	0, 50, 250, 1000 mg/kg/day
Method	:	OECD Test Guideline 408

Species	:	Rat, male and female
NOAEL	:	>= 10 mg/kg
Application Route	:	Skin contact
Exposure time	:	13 Weeks
Number of exposures	:	5 d
Dose	:	0, 10, 100, 1000 mg/kg/day
Method	:	OECD Test Guideline 411

Species	:	Mouse, male
NOAEL	:	100 mg/kg
Application Route	:	Skin contact
Exposure time	:	13 Weeks
Number of exposures	:	3 d
Dose	:	0, 1, 10, 100 mg/kg/day
Method	:	OECD Test Guideline 411

Aspiration toxicity

Not classified due to lack of data.

11.2 Information on other hazards

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

Experience with human exposure

No data available

Toxicology, Metabolism, Distribution

No data available

Neurological effects

No data available

Further information

No data available

SECTION 12: Ecological information

12.1 Toxicity

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): 2 mg/l Exposure time: 96 h Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 1,8 mg/l Exposure time: 48 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 202
Toxicity to algae/aquatic plants	:	EC50 : 11 mg/l Exposure time: 72 h Test Type: static test Test substance: Fresh water Method: EPA-660/3-75-009 NOEC : 4,2 mg/l Exposure time: 72 h Test Type: static test Test substance: Fresh water Method: EPA-660/3-75-009
Toxicity to microorganisms	:	IC50 (activated sludge): > 100 mg/l Exposure time: 3 h Test Type: static test Test substance: Fresh water
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC: 0,3 mg/l Exposure time: 21 d Species: Daphnia magna (Water flea)

Test Type: semi-static test
Test substance: Fresh water
Method: OECD Test Guideline 211

Ecotoxicology Assessment

Chronic aquatic toxicity : Toxic to aquatic life with long lasting effects.

12.2 Persistence and degradability

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Biodegradability : Test Type: aerobic
Inoculum: activated sludge, non-adapted
Concentration: 20 mg/l
Result: Not readily biodegradable.
Biodegradation: 5 %
Exposure time: 28 d
Method: OECD Test Guideline 301F

Stability in water : Degradation half life (DT50): 4,83 d (25 °C)
pH: 4
Method: OECD Test Guideline 111
Remarks: Fresh water

Degradation half life (DT50): 7,1 d (25 °C)
pH: 9
Method: OECD Test Guideline 111
Remarks: Fresh water

Degradation half life (DT50): 3,58 d (25 °C)
pH: 7
Method: OECD Test Guideline 111
Remarks: Fresh water

12.3 Bioaccumulative potential

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Bioaccumulation : Bioconcentration factor (BCF): 31
Remarks: Does not bioaccumulate.

Partition coefficient: n-octanol/water : log Pow: 3,242 (25 °C)
pH: 7,1
Method: OECD Test Guideline 117

12.4 Mobility in soil

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Distribution among environmental compartments : Koc: 445

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

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product : Dispose of contents and container in accordance with all local, regional, national and international regulations.
Do not dispose of waste into sewer.
Do not contaminate ponds, waterways or ditches with chemical or used container.

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 : UN 3082

ADR : UN 3082

RID : UN 3082

IMDG : UN 3082

IATA : UN 3082

14.2 UN proper shipping name

ADN : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

(BISPHENOL A EPOXY RESIN)

ADR : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
(BISPHENOL A EPOXY RESIN)

RID : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
(BISPHENOL A EPOXY RESIN)

IMDG : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
(BISPHENOL A EPOXY RESIN)

IATA : Environmentally hazardous substance, liquid, n.o.s.
(BISPHENOL A EPOXY RESIN)

14.3 Transport hazard class(es)

	Class	Subsidiary risks
ADN	9	
ADR	9	
RID	9	
IMDG	9	
IATA	9	

14.4 Packing group

ADN

Packing group	:	III
Classification Code	:	M6
Hazard Identification Number	:	90
Labels	:	9

ADR

Packing group	:	III
Classification Code	:	M6
Hazard Identification Number	:	90
Labels	:	9
Tunnel restriction code	:	(-)

RID

Packing group	:	III
Classification Code	:	M6
Hazard Identification Number	:	90
Labels	:	9

IMDG

Packing group	:	III
Labels	:	9
EmS Code	:	F-A, S-F

IATA (Cargo)

Packing instruction (cargo aircraft)	:	964
Packing instruction (LQ)	:	Y964
Packing group	:	III
Labels	:	Miscellaneous

IATA (Passenger)

Packing instruction (passenger aircraft)	:	964
Packing instruction (LQ)	:	Y964
Packing group	:	III
Labels	:	Miscellaneous

14.5 Environmental hazards

ADN
Environmentally hazardous : yes

ADR
Environmentally hazardous : yes

RID
Environmentally hazardous : yes

IMDG
Marine pollutant : yes

IATA (Passenger)
Environmentally hazardous : yes

IATA (Cargo)
Environmentally hazardous : yes

14.6 Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

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 - List of substances subject to authorisation (Annex XIV)	:	Not applicable
REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59).	:	This product does not contain substances of very high concern.
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 75, 3 If you intend to use this product as tattoo ink, please contact your vendor.
Seveso III: Directive 2012/18/EU of the	E2	ENVIRONMENTAL HAZARDS

European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.

Occupational Illnesses (R-461-3, France)	:	51
Installations classified for the protection of the environment (Environment Code R511-9)	:	4511

Other regulations:

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

The components of this product are reported in the following inventories:

DSL	:	All components of this product are on the Canadian DSL
AIIC	:	On the inventory, or in compliance with the inventory
ENCS	:	On the inventory, or in compliance with the inventory
KECI	:	On the inventory, or in compliance with the inventory
PICCS	:	On the inventory, or in compliance with the inventory
IECSC	:	On the inventory, or in compliance with the inventory
TCSI	:	On the inventory, or in compliance with the inventory
TSCA	:	All substances listed as active on the TSCA inventory

Inventories

AICS (Australia), AIIC (Australia), DSL (Canada), IECSC (China), ENCS (Japan), KECI (Korea), NZIOC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (United States of America (USA))

15.2 Chemical safety assessment

For further information see eSDS.

SECTION 16: Other information

Further information

The information and recommendations in this publication are to the best of our knowledge, information and belief accurate at the date of publication, NOTHING HEREIN IS TO BE CONSTRUED AS A WARRANTY, EXPRESS OR OTHERWISE.

IN ALL CASES, IT IS THE RESPONSIBILITY OF THE USER TO DETERMINE THE APPLICABILITY OF SUCH INFORMATION AND RECOMMENDATIONS AND THE SUITABILITY OF ANY PRODUCT FOR ITS OWN PARTICULAR PURPOSE.

THE PRODUCT MAY PRESENT HAZARDS AND SHOULD BE USED WITH CAUTION. WHILE CERTAIN HAZARDS ARE DESCRIBED IN THIS PUBLICATION, NO GUARANTEE IS MADE THAT THESE ARE THE ONLY HAZARDS THAT EXIST.

Hazards, toxicity and behaviour of the products may differ when used with other materials and are dependent upon the manufacturing circumstances or other processes. Such hazards, toxicity and behaviour should be determined by the user and made known to handlers, processors and end users.

The trademarks above are the property of Huntsman Corporation or an affiliate thereof.

NO PERSON OR ORGANIZATION EXCEPT A DULY AUTHORIZED HUNTSMAN EMPLOYEE IS AUTHORIZED TO PROVIDE OR MAKE AVAILABLE DATA SHEETS FOR HUNTSMAN PRODUCTS. DATA SHEETS FROM UNAUTHORIZED SOURCES MAY CONTAIN INFORMATION THAT IS NO LONGER CURRENT OR ACCURATE.

Annex to the Safety Data Sheet (eSDS)

ES 1	Manufacture of substance.
ES 2	Formulation and (re)packing.
ES 3	Use at industrial sites:, Monomers
ES 4	Use at industrial sites:, Use as an intermediate.
ES 5	Use at industrial sites:, Industrial application of coatings and inks
ES 6	Use at industrial sites:, Use of lubricants in high energy open processes.
ES 7	Professional application of coatings and inks
ES 8	Consumer use

ES 1: Manufacture of substance.; Industrial uses (SU3).

1.1. Title section

Exposure Scenario name	:	Manufacture of substance.
Structured Short Title	:	; Industrial uses (SU3).

Environment		
CS 1	**Manufacture of the substance**	ERC1
Worker		
CS 2	**Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions**	PROC2

CS 3	**Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities**	PROC8b

CS 4	**Use as laboratory reagent**	PROC15

1.2. Conditions of use affecting exposure

1.2.1. Control of environmental exposure: Manufacture of the substance (ERC1)

Product (article) characteristics		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Amounts used	:	120000 tonnes/year
Other conditions affecting environmental exposure		
Receiving surface water flow	:	18 000 m3/d
Indoor or outdoor use	:	Indoor use

1.2.2. 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
Covers percentage substance in the product up to 100 %.

Physical form of product	:	Liquid
Temperature	:	< 70 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	480 minutes/day
Technical and organisational conditions and measures		
Assumes a good basic standard of occupational hygiene is implemented Dermal - minimum efficiency of 80 % Inhalation - minimum efficiency of 0 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Use suitable eye protection. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 80 % Inhalation - minimum efficiency of 0 %		
Wear a respirator conforming to EN140. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Outdoor
Professional or industrial settings	:	Industrial use
Temperature	:	< 70 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Use frequency	:	480 minutes/day
Conditions and measures related to personal protection, hygiene and health evaluation		
Use suitable eye protection. Wear suitable respiratory protection. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 % Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Outdoor

Professional or industrial settings	:	Industrial use

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

Product (article) characteristics
Covers percentage substance in the product up to 100 %.
Physical form of product : Liquid
Amount used (or contained in articles), frequency and duration of use/exposure
Use frequency : 480 minutes/day
Technical and organisational conditions and measures
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Dermal - minimum efficiency of 0 % 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 specific activity training. Use suitable eye protection. Dermal - minimum efficiency of 80 % Inhalation - minimum efficiency of 0 %
Other conditions affecting workers exposure
Indoor or outdoor use : Indoor
Temperature : Assumes process temperature up to 40 °C

1.3. Exposure estimation and reference to its source

1.3.1. Environmental release and exposure: Manufacture of the substance (ERC1)

Release route	Release rate	Release estimation method
Soil	0,01 %	
Water	0,054 kg/day	
Air	0 %	

Protection Target	Exposure estimate	RCR
Freshwater	0,00293mg/L (EUSES v2.1)	0,489
Freshwater sediment	0,141mg/kg dry weight (EUSES v2.1)	0,414
Marine water	0,000285mg/L (EUSES v2.1)	0,475

Marine sediment	0,014mg/kg dry weight (EUSES v2.1)	0,402
Sewage treatment plant	0,026mg/L (EUSES v2.1)	< 0,01
Agricultural soil	0,045mg/kg dry weight (EUSES v2.1)	0,701
Predator's prey (freshwater)	0,048mg/kg wet weight (EUSES v2.1)	< 0,01
Predator's prey (marine water)	0,00453mg/kg wet weight (EUSES v2.1)	< 0,01
Top predator's prey (marine water)	0,00164mg/kg wet weight (EUSES v2.1)	< 0,01
Predator's prey (terrestrial)	0,051mg/kg wet weight (EUSES v2.1)	< 0,01
Man via environment - Inhalation	Concentration in air: 3.45E-11 mg/m³ (EUSES v2.1)	< 0,01
Man via environment - Oral	0,00134mg/kg bw/day (EUSES v2.1)	< 0,01

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0,993mg/m³ (ECETOC TRA worker v3)	0,201
inhalative	local	long-term	0,993mg/m³ (ECETOC TRA worker v3)	
inhalative	local	short-term	0,993mg/m³ (ECETOC TRA worker v3)	
dermal	systemic	long-term	0,274mg/kg bw/day (ECETOC TRA worker v3)	0,365
dermal	local	short-term	0,04mg/cm2 (ECETOC TRA worker v3)	
dermal	local	short-term	0,04mg/cm2 (ECETOC TRA worker v3)	
combined routes				0,567

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

Exposure route	Health effect	Exposure	Exposure	RCR

		indicator	estimate	
inhalative	systemic	long-term	0,99mg/m³ (ECETOC TRA worker v3)	0,02
inhalative	local	long-term	0,99mg/m³ (ECETOC TRA worker v3)	
inhalative	local	short-term	0,99mg/m³ (ECETOC TRA worker v3)	
dermal	systemic	long-term	0,686mg/kg bw/day (ECETOC TRA worker v3)	0,914
dermal	local	short-term	0,05mg/cm2 (ECETOC TRA worker v3)	
dermal	local	short-term	0,05mg/cm2 (ECETOC TRA worker v3)	
combined routes				0,934

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0,993mg/m³ (ECETOC TRA worker v3)	0,201
inhalative	local	long-term	0,993mg/m³ (ECETOC TRA worker v3)	
inhalative	local	short-term	0,993mg/m³ (ECETOC TRA worker v3)	
dermal	systemic	long-term	0,068mg/kg bw/day (ECETOC TRA worker v3)	0,091
dermal	local	short-term	0,02mg/cm2 (ECETOC TRA worker v3)	
dermal	local	short-term	0,02mg/cm2 (ECETOC TRA worker v3)	
combined routes				0,292

1.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES
Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

ES 2: Formulation and (re)packing.; Formulation [mixing] of preparations and/ or re-packaging (excluding alloys) (SU 10).

2.1. Title section

Exposure Scenario name	:	Formulation and (re)packing.
Structured Short Title	:	; Formulation [mixing] of preparations and/ or re-packaging (excluding alloys) (SU 10).

Environment		
CS 1	**Formulation of preparations**	ERC2

CS 2	**Formulation of preparations**	ERC2
Worker		
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	**Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities**	PROC8b

CS 6	**Transfer of substance or preparation into small containers (dedicated filling line, including weighing)**	PROC9

2.2. Conditions of use affecting exposure

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

Product (article) characteristics		
Physical form of product	:	Low volatile liquid
Vapour pressure	:	Vapour pressure < 0.01 Pa at standard temperature and pressure
Amount used (or contained in articles), frequency and duration of use/exposure		
Amount per use	:	25000 tonnes/year
Daily amount per site	:	80 tonnes/day
Conditions and measures related to sewage treatment plant		

STP type	:	Municipal sewage treatment plant
STP sludge treatment	:	Can be landfilled, when in compliance with local regulations. Controlled application of sewage sludge to agricultural soil
STP effluent	:	2 000 m3/d
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	Waste gases incinerated.
Waste - minimum efficiency of	:	95 %
Other conditions affecting environmental exposure		
Receiving surface water flow	:	18 000 m3/d
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100
Indoor or outdoor use	:	Indoor use

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

Product (article) characteristics		
Physical form of product	:	Low volatile liquid
Vapour pressure	:	Vapour pressure < 0.01 Pa at standard temperature and pressure
Amount used (or contained in articles), frequency and duration of use/exposure		
Amount per use	:	25000 tonnes/year
Daily amount per site	:	80 tonnes/day
Release type	:	Continuous release
Emission days	:	360
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP sludge treatment	:	Can be landfilled, when in compliance with local regulations. Controlled application of sewage sludge to agricultural soil
STP effluent	:	2 000 m3/d
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	Waste gases incinerated.
Waste - minimum efficiency of	:	95 %

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

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Temperature	:	<= 70 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
No other specific measures identified. Ensure operatives are trained to minimise exposures. Ensure that direct skin contact is avoided. Wash off any skin contamination immediately.		
Assumes a good basic standard of occupational hygiene is implemented		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 0 %		
Assumes a good basic standard of occupational hygiene is implemented		
Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374. Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin. Wear suitable respiratory protection. Dermal - minimum efficiency of 80 % Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use

Temperature	:	<= 70 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Temperature	:	<= 70 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
No other specific measures identified. Ensure operatives are trained to minimise exposures. Ensure that direct skin contact is avoided. Wash off any skin contamination immediately.		
Assumes a good basic standard of occupational hygiene is implemented		
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 30 %		
Assumes a good basic standard of occupational hygiene is implemented		
Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374. Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin. Wear suitable respiratory protection. Dermal - minimum efficiency of 95 % Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	<= 70 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Temperature	:	<= 70 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
No other specific measures identified. Ensure operatives are trained to minimise exposures. Ensure that direct skin contact is avoided. Wash off any skin contamination immediately.		
Assumes a good basic standard of occupational hygiene is implemented		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 0 %		
Assumes a good basic standard of occupational hygiene is implemented		
Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374. Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin. Wear suitable respiratory protection. Dermal - minimum efficiency of 95 % Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	<= 70 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Temperature	:	50 °C

Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
No other specific measures identified. Ensure operatives are trained to minimise exposures. Ensure that direct skin contact is avoided. Wash off any skin contamination immediately.		
Assumes a good basic standard of occupational hygiene is implemented		
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 30 %		
Assumes a good basic standard of occupational hygiene is implemented		
Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374. Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin. Wear suitable respiratory protection. Dermal - minimum efficiency of 95 % Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	50 °C

2.3. Exposure estimation and reference to its source

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

Release route	Release rate	Release estimation method
Water	0,056 kg/day	FEICA SPERC 2.1b.v1
Air	0 kg/day	
Soil	0 kg/day	FEICA SPERC 2.1b.v1

Protection Target	Exposure estimate	RCR
Freshwater	3.03E-03mg/L (ECETOC TRA	0,505

	environment v2.0)	
Freshwater sediment	0,146mg/kg dry weight (ECETOC TRA environment v2.0)	0,427
Marine water	2.95E-4mg/L (ECETOC TRA environment v2.0)	0,491
Marine sediment	0,014mg/kg dry weight (ECETOC TRA environment v2.0)	0,416
Sewage treatment plant	0,027mg/L (ECETOC TRA environment v2.0)	< 0,01
Agricultural soil	0,047mg/kg dry weight (ECETOC TRA environment v2.0)	0,727
Predator's prey (freshwater)	0,047mg/kg wet weight	< 0,01
Predator's prey (marine water)	0,0443mg/kg wet weight	< 0,01
Top predator's prey (marine water)	0,0162mg/kg wet weight	< 0,01
Predator's prey (terrestrial)	0,053mg/kg wet weight	< 0,01
Man via environment - Inhalation	3.46E-11mg/kg wet weight	< 0,01
Man via environment - Oral	0,00138mg/m³	< 0,01
Man via the environment		< 0,01

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

Release route	Release rate	Release estimation method
Water	0,056 kg/day	FEICA SPERC 2.1b.v1
Air	0 kg/day	
Soil	0 kg/day	FEICA SPERC 2.1b.v1

Protection Target	Exposure estimate	RCR
Freshwater	3.03E-03mg/L (ECETOC TRA environment v2.0)	0,505
Freshwater sediment	0,146mg/kg dry weight (ECETOC TRA environment v2.0)	0,427
Marine water	2.95E-4mg/L (ECETOC TRA environment v2.0)	0,491
Marine sediment	0,014mg/kg dry weight (ECETOC TRA environment v2.0)	0,416
Sewage treatment plant	0,027mg/L (ECETOC TRA environment v2.0)	< 0,01
Agricultural soil	0,047mg/kg dry weight (ECETOC TRA environment v2.0)	0,727

Predator's prey (freshwater)	0,047mg/kg wet weight	< 0,01
Predator's prey (marine water)	0,0443mg/kg wet weight	< 0,01
Top predator's prey (marine water)	0,0162mg/kg wet weight	< 0,01
Predator's prey (terrestrial)	0,053mg/kg wet weight	< 0,01
Man via environment - Inhalation	3.46E-11mg/kg wet weight	< 0,01
Man via environment - Oral	0,00138mg/m³	< 0,01
Man via the environment		< 0,01

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0,142mg/m³ (ECETOC TRA worker v2.0)	0,029
dermal	systemic	long-term	0,138mg/kg bw/day (ECETOC TRA worker v2.0)	0.0184
combined routes			(ECETOC TRA worker v2.0)	0,213
inhalative	local	long-term	0,142mg/m³ (ECETOC TRA worker v2.0)	Qualitative risk
inhalative	local	short-term	0,142mg/m³ (ECETOC TRA worker v2.0)	Qualitative risk
dermal	local	long-term	0,04mg/m³ (ECETOC TRA worker v2.0)	Qualitative risk
dermal	local	short-term	0,04mg/m³ (ECETOC TRA worker v2.0)	Qualitative risk

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0,099mg/m³ (ECETOC TRA worker v2.0)	0,02
dermal	systemic	long-term	0,343mg/kg bw/day (ECETOC TRA worker v2.0)	0,457
combined routes			(ECETOC TRA worker v2.0)	0,477

inhalative	local	long-term	0,099mg/m³ (ECETOC TRA worker v2.0)	Qualitative risk
inhalative	local	short-term	0,099mg/m³ (ECETOC TRA worker v2.0)	Qualitative risk
dermal	local	long-term	0,05mg/m³ (ECETOC TRA worker v2.0)	Qualitative risk
dermal	local	short-term	0,05mg/m³ (ECETOC TRA worker v2.0)	Qualitative risk

2.3.5. 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
inhalative	systemic	long-term	7.09E-3 mg/m³mg/m³ (ECETOC TRA worker v2.0)	< 0,01
dermal	systemic	long-term	0,686mg/kg bw/day (ECETOC TRA worker v2.0)	0,914
combined routes			(ECETOC TRA worker v2.0)	0,915
inhalative	local	long-term	7.09E-3 mg/m³mg/m³ (ECETOC TRA worker v2.0)	Qualitative risk
inhalative	local	short-term	7.09E-3 mg/m³mg/m³ (ECETOC TRA worker v2.0)	Qualitative risk
dermal	local	long-term	0,05mg/m³ (ECETOC TRA worker v2.0)	Qualitative risk
dermal	local	short-term	0,05mg/m³ (ECETOC TRA worker v2.0)	Qualitative risk

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0,099mg/m³ (ECETOC TRA worker v2.0)	0,02

dermal	systemic	long-term	0,343mg/kg bw/day (ECETOC TRA worker v2.0)	0,457
combined routes			(ECETOC TRA worker v2.0)	0,477
inhalative	local	long-term	0,099mg/m³ (ECETOC TRA worker v2.0)	Qualitative risk
inhalative	local	short-term	0,099mg/m³ (ECETOC TRA worker v2.0)	Qualitative risk
dermal	local	long-term	0,05mg/m³ (ECETOC TRA worker v2.0)	Qualitative risk
dermal	local	short-term	0,05mg/m³ (ECETOC TRA worker v2.0)	Qualitative risk

2.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES
Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

ES 3: Use at industrial sites:, Monomers; Industrial uses: Uses of substances as such or in preparations at industrial sites (SU 3).

3.1. Title section

Exposure Scenario name	:	Use at industrial sites:, Monomers
Structured Short Title	:	; Industrial uses: Uses of substances as such or in preparations at industrial sites (SU 3).

Environment		
CS 1	**Industrial use of processing aids in processes and products, not becoming part of articles**	ERC4
CS 2	**Use at industrial site leading to inclusion into/onto article**	ERC5
CS 3	**Industrial use of monomers for manufacture of thermoplastics**	ERC6c
Worker		
CS 4	**Use in closed process, no likelihood of exposure**	PROC1
CS 5	**Use in closed, continuous process with occasional controlled exposure**	PROC2
CS 6	**Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition**	PROC3
CS 7	**Transfer of substance or mixture (charging/discharging) at dedicated facilities**	PROC8b

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)

Amount used (or contained in articles), frequency and duration of use/exposure		
Daily amount per site	:	200 tonnes/day
Annual amount per site	:	35400 tonnes/year
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP sludge treatment	:	Can be landfilled, when in compliance with local regulations.

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
Indoor or outdoor use	:	Indoor use

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

Amount used (or contained in articles), frequency and duration of use/exposure		
Amount per use	:	200 tonnes/day
Msperc	:	35400 tonnes/year
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP sludge treatment	:	Can be landfilled, when in compliance with local regulations.
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
Indoor or outdoor use	:	Indoor use

3.2.3. Control of environmental exposure: Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article) (ERC6c)

Amount used (or contained in articles), frequency and duration of use/exposure		
Amount per use	:	200 tonnes/day
Msperc	:	35400 tonnes/year
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP sludge treatment	:	Can be landfilled, when in compliance with local regulations.
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
Indoor or outdoor use	:	Indoor use

3.2.4. Control of worker exposure: Use in closed process, no likelihood of exposure (PROC1)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Assumes a good basic standard of occupational hygiene is implemented Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.		
No other specific measures identified. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Assumes a good basic standard of occupational hygiene is implemented Training for staff on good practice		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374. Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin. Dermal - minimum efficiency of 80 %		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor
Temperature	:	<= 70 °C

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

Product (article) characteristics
Covers percentage substance in the product up to 100 %.

Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Assumes a good basic standard of occupational hygiene is implemented Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.		
No other specific measures identified. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Assumes a good basic standard of occupational hygiene is implemented Training for staff on good practice		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374. Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin. Dermal - minimum efficiency of 80 %		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor
Temperature	:	<= 70 °C

3.2.6. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours 480 min
Technical and organisational conditions and measures		
Assumes a good basic standard of occupational hygiene is implemented		
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 chemically resistant gloves (tested to EN374) in combination with specific activity training. Use suitable eye protection. Dermal - minimum efficiency of 80 %
Other conditions affecting workers exposure
Indoor or outdoor use : Indoor
Temperature : < 70 °C

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

Product (article) characteristics
Covers percentage substance in the product up to 100 %.
Physical form of product : Liquid
Amount used (or contained in articles), frequency and duration of use/exposure
Duration : Covers daily exposures up to 8 hours
Use frequency : 480 minutes/day
Technical and organisational conditions and measures
Assumes a good basic standard of occupational hygiene is implemented Provide a basic standard of general ventilation (1 to 3 air changes per hour). Local exhaust ventilation Dermal - minimum efficiency of 0 % 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. Use suitable eye protection. Dermal - minimum efficiency of 95 %
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %
Other conditions affecting workers exposure
Indoor or outdoor use : Indoor
Temperature : <= 70 °C

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)

Release route	Release rate	Release estimation method

Water	0,06 kg/day	
Air	0 kg/day	
Soil	Release factor after on site RMM: 1E-3%kg/day	

Protection Target	Exposure estimate	RCR
Sewage treatment plant	0,028mg/L (ECETOC TRA environment v2.0)	< 0,01
Freshwater	3.22E-3mg/L (ECETOC TRA environment v2.0)	0,536
Freshwater sediment	0,155mg/kg dry weight (ECETOC TRA environment v2.0)	0,454
Agricultural soil	0,05mg/kg dry weight (ECETOC TRA environment v2.0)	0,779
Marine water	3.14E-4mg/L (ECETOC TRA environment v2.0)	0,523
Marine sediment	0,015mg/kg dry weight (ECETOC TRA environment v2.0)	0,442
Predator's prey (freshwater)	0,033mg/kg wet weight	< 0,01
Predator's prey (marine water)	3.02E-3mg/kg wet weight	< 0,01
Top predator's prey (marine water)	1.34E-3mg/kg wet weight	< 0,01
Predator's prey (terrestrial)	0,056mg/kg wet weight	< 0,01
Man via environment - Inhalation	3.45E-11mg/m³	< 0,01
Man via environment - Oral	1.42E-3mg/kg dry weight	< 0,01
Man via the environment		< 0,01

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

Release route	Release rate	Release estimation method
Water	0 kg/day	
Air	0 kg/day	
Soil	kg/day	

Protection Target	Exposure estimate	RCR
Freshwater	0,000376mg/L (EUSES v2.1)	0,063
Freshwater sediment	0,018mg/kg dry weight (EUSES v2.1)	0,053

Marine water	0,0000295mg/L (EUSES v2.1)	0,049
Marine sediment	0,00142mg/kg dry weight (EUSES v2.1)	0,042
Sewage treatment plant	0mg/L (EUSES v2.1)	< 0,01
Agricultural soil	Local PEC: 4.17E-7 mg/kg dw (EUSES v2.1)	< 0,01
Predator's prey (freshwater)	0,012mg/kg wet weight (EUSES v2.1)	< 0,01
Predator's prey (marine water)	0,000913mg/kg wet weight (EUSES v2.1)	< 0,01
Top predator's prey (marine water)	0,000913mg/kg wet weight (EUSES v2.1)	< 0,01
Predator's prey (terrestrial)	0,000166mg/kg wet weight (EUSES v2.1)	< 0,01
Man via environment - Inhalation	Concentration in air: 3.43E-11 mg/m³ (EUSES v2.1)	< 0,01
Man via environment - Oral	Exposure via food consumption: 2.99E-5 mg/kg bw/day (EUSES v2.1)	< 0,01
Man via the environment	(EUSES v2.1)	< 0,01

3.3.3. Environmental release and exposure: Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article) (ERC6c)

Release route	Release rate	Release estimation method
Water	0 kg/day	
Air	0 kg/day	
Soil	kg/day	

Protection Target	Exposure estimate	RCR
Freshwater	0,000376mg/L (EUSES v2.1)	0,063
Freshwater sediment	0,018mg/kg dry weight (EUSES v2.1)	0,053
Marine water	0,0000295mg/L (EUSES v2.1)	0,049
Marine sediment	0,00142mg/kg dry weight (EUSES v2.1)	0,042
Sewage treatment plant	0mg/L (EUSES v2.1)	< 0,01
Agricultural soil	Local PEC: 4.17E-7 mg/kg dw (EUSES v2.1)	< 0,01
Predator's prey (freshwater)	0,012mg/kg wet weight (EUSES v2.1)	< 0,01

Predator's prey (marine water)	0,000913mg/kg wet weight (EUSES v2.1)	< 0,01
Top predator's prey (marine water)	0,000913mg/kg wet weight (EUSES v2.1)	< 0,01
Predator's prey (terrestrial)	0,000166mg/kg wet weight (EUSES v2.1)	< 0,01
Man via environment - Inhalation	Concentration in air: 3.43E-11 mg/m³ (EUSES v2.1)	< 0,01
Man via environment - Oral	Exposure via food consumption: 2.99E-5 mg/kg bw/day (EUSES v2.1)	< 0,01
Man via the environment	(EUSES v2.1)	< 0,01

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0,014mg/m³ (ECETOC TRA worker v2.0)	< 0,01
inhalative	local	long-term	0,014mg/m³ (ECETOC TRA worker v2.0)	
inhalative	local	short-term	0,057mg/m³ (ECETOC TRA worker v2.0)	
dermal	systemic	long-term	6.8E-3 mg/kg bw/day (TRA Workers) (ECETOC TRA worker v2.0)	0,001
dermal	local	long-term	1.98E-3 mg/cm² (TRA Workers) (ECETOC TRA worker v2.0)	
dermal	local	short-term	1.98E-3 mg/cm² (TRA Workers) (ECETOC TRA worker v2.0)	
combined routes			(ECETOC TRA worker v2.0)	0,012

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0,993mg/m³ (ECETOC TRA worker v3)	0,201

inhalative	local	long-term	0,993mg/m³ (ECETOC TRA worker v3)	
inhalative	local	short-term	0,993mg/m³ (ECETOC TRA worker v3)	
dermal	systemic	long-term	0,274mg/kg bw/day (ECETOC TRA worker v3)	0,365
dermal	local	short-term	0,04mg/cm2 (ECETOC TRA worker v3)	
dermal	local	short-term	0,04mg/cm2 (ECETOC TRA worker v3)	
combined routes				0,567

3.3.6. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0,993mg/m³ (ECETOC TRA worker v3)	0,201
inhalative	local	long-term	0,993mg/m³ (ECETOC TRA worker v3)	
inhalative	local	short-term	0,993mg/m³ (ECETOC TRA worker v3)	
dermal	systemic	long-term	0,138mg/kg bw/day (ECETOC TRA worker v3)	0,184
dermal	local	short-term	0,04mg/cm2 (ECETOC TRA worker v3)	
dermal	local	short-term	0,04mg/cm2 (ECETOC TRA worker v3)	
combined routes				0,385

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0,007mg/m³	< 0,01

			(ECETOC TRA worker v3)	
inhalative	local	long-term	0,007mg/m³ (ECETOC TRA worker v3)	
inhalative	local	short-term	0,007mg/m³ (ECETOC TRA worker v3)	
dermal	systemic	long-term	0,686mg/kg bw/day (ECETOC TRA worker v3)	0,914
dermal	local	short-term	0,05mg/cm2 (ECETOC TRA worker v3)	
dermal	local	short-term	0,05mg/cm2 (ECETOC TRA worker v3)	
combined routes				0,915

3.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES
Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

ES 4: Use at industrial sites:, Use as an intermediate.Intermediate (PC19); Industrial uses: Uses of substances as such or in preparations at industrial sites (SU 3).

4.1. Title section

Exposure Scenario name	:	Use at industrial sites:, Use as an intermediate.
Structured Short Title	:	Intermediate (PC19); Industrial uses: Uses of substances as such or in preparations at industrial sites (SU 3).

Environment		
CS 1	**Use as an intermediate**	ERC6a
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	**Transfer of substance or mixture (charging/discharging) at dedicated facilities**	PROC8b

4.2. Conditions of use affecting exposure

4.2.1. Control of environmental exposure: Industrial use resulting in manufacture of another substance (use of intermediates) (ERC6a)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount per site	:	12000 tonnes/year
Amounts used	:	40 tonnes/day
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP sludge treatment	:	Can be landfilled, when in compliance with local regulations.
STP effluent	:	2 000 m3/d

Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	Do not apply industrial sludge to natural soils.
Waste treatment	:	Liquid and/or solid waste is treated by incineration.
Other conditions affecting environmental exposure		
Receiving surface water flow	:	18 000 m3/d
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100
Indoor or outdoor use	:	Indoor use

4.2.2. Control of worker exposure: Use in closed process, no likelihood of exposure (PROC1)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Low volatile liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Assumes a good basic standard of occupational hygiene is implemented Provide a basic standard of general ventilation (1 to 3 air changes per hour). Inhalation - minimum efficiency of 0 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Use suitable eye protection. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 80 % Inhalation - minimum efficiency of 0 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor
Temperature	:	< 70 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid

Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Assumes a good basic standard of occupational hygiene is implemented Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Dermal - minimum efficiency of 80 % Inhalation - minimum efficiency of 30 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Use suitable eye protection. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 80 % Inhalation - minimum efficiency of 0 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor
Temperature	:	< 70 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Assumes a good basic standard of occupational hygiene is implemented Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Dermal - minimum efficiency of 80 % Inhalation - minimum efficiency of 30 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Use suitable eye protection. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 80 % Inhalation - minimum efficiency of 0 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor

Temperature	:	< 70 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Assumes a good basic standard of occupational hygiene is implemented Provide a basic standard of general ventilation (1 to 3 air changes per hour). Local exhaust ventilation Dermal - minimum efficiency of 0 % 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. Use suitable eye protection. Dermal - minimum efficiency of 95 %		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor
Temperature	:	< 70 °C

4.3. Exposure estimation and reference to its source

4.3.1. Environmental release and exposure: Industrial use resulting in manufacture of another substance (use of intermediates) (ERC6a)

Release route	Release rate	Release estimation method
Water	0,6 kg/day	ESVOC SPERC 6.1a.v1
Air	0 kg/day	ESVOC SPERC 6.1a.v1
Soil	0,1 %	ESVOC SPERC 6.1a.v1

Protection Target	Exposure estimate	RCR

Freshwater	3.22E-3mg/L (EUSES v2.1)	0,536
Freshwater sediment	0,155mg/kg dry weight (EUSES v2.1)	0,454
Marine water	3.14E-4mg/L (EUSES v2.1)	0,523
Marine sediment	0,015mg/kg dry weight (EUSES v2.1)	0,442
Sewage treatment plant	0,028mg/L (EUSES v2.1)	< 0,01
Agricultural soil	0,05mg/kg dry weight (EUSES v2.1)	0,779
Predator's prey (freshwater)	0,048mg/kg wet weight (EUSES v2.1)	< 0,01
Predator's prey (marine water)	4.53E-3mg/kg wet weight (EUSES v2.1)	< 0,01
Top predator's prey (marine water)	1.64E-3mg/kg wet weight (EUSES v2.1)	< 0,01
Predator's prey (terrestrial)	0,056mg/kg wet weight (EUSES v2.1)	< 0,01
Man via environment - Inhalation	Concentration in air: 3.45E-11 mg/m³ (EUSES v2.1)	< 0,01
Man via environment - Oral	1.47E-3mg/kg bw/day (EUSES v2.1)	< 0,01
Man via the environment	(EUSES v2.1)	< 0,01

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0,142mg/m³ (ECETOC TRA worker v3)	0,029
inhalative	local	long-term	0,142mg/m³ (ECETOC TRA worker v3)	
inhalative	local	short-term	0,142mg/m³ (ECETOC TRA worker v3)	
dermal	systemic	long-term	6.8E-3 mg/kg bw/day (TRA Workers)mg/kg bw/day (ECETOC TRA worker v3)	< 0,01
dermal	local	short-term	1.98E-3 mg/cm² (TRA Workers)mg/cm2 (ECETOC TRA worker v3)	

dermal	local	short-term	1.98E-3 mg/cm² (TRA Workers)mg/cm2 (ECETOC TRA worker v3)	
combined routes				0,038

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0,993mg/m³ (ECETOC TRA worker v3)	0,201
inhalative	local	long-term	0,993mg/m³ (ECETOC TRA worker v3)	
inhalative	local	short-term	0,993mg/m³ (ECETOC TRA worker v3)	
dermal	systemic	long-term	0,274mg/kg bw/day (ECETOC TRA worker v3)	0,365
dermal	local	short-term	0,04mg/cm2 (ECETOC TRA worker v3)	
dermal	local	short-term	0,04mg/cm2 (ECETOC TRA worker v3)	
combined routes				0,567

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0,993mg/m³ (ECETOC TRA worker v3)	0,201
inhalative	local	long-term	0,993mg/m³ (ECETOC TRA worker v3)	
inhalative	local	short-term	0,993mg/m³ (ECETOC TRA worker v3)	
dermal	systemic	long-term	0,138mg/kg bw/day (ECETOC TRA worker v3)	0,184
dermal	local	short-term	0,04mg/cm2	

			(ECETOC TRA worker v3)	
dermal	local	short-term	0,04mg/cm2 (ECETOC TRA worker v3)	
combined routes				0,385

4.3.5. 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
inhalative	systemic	long-term	0,007mg/m³ (ECETOC TRA worker v3)	< 0,01
inhalative	local	long-term	0,007mg/m³ (ECETOC TRA worker v3)	
inhalative	local	short-term	0,071mg/m³ (ECETOC TRA worker v3)	
dermal	systemic	long-term	0,686mg/kg bw/day (ECETOC TRA worker v3)	0,914
dermal	local	short-term	0,05mg/cm2 (ECETOC TRA worker v3)	
dermal	local	short-term	0,05mg/cm2 (ECETOC TRA worker v3)	
combined routes				0,915

4.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES
Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

ES 5: Use at industrial sites:, Industrial application of coatings and inks; Professional uses: Public domain (administration, education, entertainment, services, craftsmen) (SU 22).

5.1. Title section

Exposure Scenario name	:	Use at industrial sites:, Industrial application of coatings and inks
Structured Short Title	:	; Professional uses: Public domain (administration, education, entertainment, services, craftsmen) (SU 22).

Environment		
CS 1	**Use at industrial site leading to inclusion into/onto article**	ERC5
Worker		
CS 2	**Industrial spraying**	PROC7
CS 3	**Transfer of substance or mixture (charging/discharging) at non dedicated-facilities**	PROC8a
CS 4	**Transfer of substance or mixture (charging/discharging) at dedicated facilities**	PROC8b
CS 5	**Transfer of substance or mixture into small containers (dedicated filling line, including weighing)**	PROC9
CS 6	**Roller application or brushing**	PROC10
CS 7	**Non-industrial spraying**	PROC11
CS 8	**Treatment of articles by dipping and pouring**	PROC13
CS 9	**Tabletting, compression, extrusion, pelettisation, granulation**	PROC14
CS 10	**Use as laboratory reagent**	PROC15
CS 11	**Low energy manipulation and handling of substances bound in/on materials and/or articles**	

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)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount per site	:	30000 tonnes/year
Daily amount per site	:	100 tonnes/day
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
Additional information on STP	:	Biological elimination
STP sludge treatment	:	Can be landfilled, when in compliance with local regulations.
STP effluent	:	2 000 m3/d
Other conditions affecting environmental exposure		
Receiving surface water flow	:	18 000 m3/d

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

Product (article) characteristics		
Covers percentage substance in the product up to 25 %.		
Physical form of product	:	Liquid
Vapour pressure	:	0,00741 Pa
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Use suitable eye protection. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Wear suitable respiratory protection.		

Dermal - minimum efficiency of 99 % Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Professional use
Temperature	:	Assumes process temperature up to 70 °C

5.2.3. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)

Product (article) characteristics		
Covers percentage substance in the product up to 25 %.		
Physical form of product	:	Liquid
Vapour pressure	:	0,00741 Pa
Temperature	:	70 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 0 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Use suitable eye protection. Dermal - minimum efficiency of 95 % Inhalation - minimum efficiency of 0 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Professional use
Temperature	:	70 °C

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

Product (article) characteristics
Covers percentage substance in the product up to 25 %.

Physical form of product	:	Liquid
Vapour pressure	:	0,00741 Pa
Temperature	:	70 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Assumes a good basic standard of occupational hygiene is implemented Provide a basic standard of general ventilation (1 to 3 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 specific activity training. Use suitable eye protection. Dermal - minimum efficiency of 95 % Inhalation - minimum efficiency of 0 %		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor
Temperature	:	70 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Vapour pressure	:	0,000586 Pa
Temperature	:	< 50 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Assumes a good basic standard of occupational hygiene is implemented Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Dermal - minimum efficiency of 0 % 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 specific activity training. Use suitable eye protection. Dermal - minimum efficiency of 95 % Inhalation - minimum efficiency of 0 %
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %
Other conditions affecting workers exposure
Indoor or outdoor use : Indoor
Temperature : < 50 °C

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

Product (article) characteristics
Covers percentage substance in the product up to 25 %.
Physical form of product : Liquid
Vapour pressure : 0,00741 Pa
Temperature : < 70 °C
Amount used (or contained in articles), frequency and duration of use/exposure
Duration : Covers daily exposures up to 8 hours
Technical and organisational conditions and measures
Assumes a good basic standard of occupational hygiene is implemented Provide a basic standard of general ventilation (1 to 3 air changes per hour). Local exhaust ventilation Dermal - minimum efficiency of 0 % 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. Use suitable eye protection. Dermal - minimum efficiency of 99 % Inhalation - minimum efficiency of 0 %
Other conditions affecting workers exposure
Indoor or outdoor use : Indoor
Temperature : < 70 °C

5.2.7. Control of worker exposure: Non-industrial spraying (PROC11)

Product (article) characteristics
Covers percentage substance in the product up to 25 %.

Physical form of product	:	Liquid
Temperature	:	< 40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Use suitable eye protection. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Wear suitable respiratory protection. Dermal - minimum efficiency of 99 % Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor
Temperature	:	< 40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 25 %.		
Physical form of product	:	Liquid
Vapour pressure	:	0,00741 Pa
Temperature	:	< 70 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Assumes a good basic standard of occupational hygiene is implemented Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 0 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Use suitable eye protection. Dermal - minimum efficiency of 95 %		

Inhalation - minimum efficiency of 0 %
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %
Other conditions affecting workers exposure
Indoor or outdoor use : Indoor
Temperature : < 70 °C

5.2.9. Control of worker exposure: Tabletting, compression, extrusion, pelettisation, granulation (PROC14)

Product (article) characteristics
Covers percentage substance in the product up to 100 %.
Physical form of product : Liquid
Temperature : < 40 °C
Amount used (or contained in articles), frequency and duration of use/exposure
Duration : Covers daily exposures up to 8 hours
Technical and organisational conditions and measures
Assumes a good basic standard of occupational hygiene is implemented Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Dermal - minimum efficiency of 0 % 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 specific activity training. Use suitable eye protection. Dermal - minimum efficiency of 95 % Inhalation - minimum efficiency of 0 %
Other conditions affecting workers exposure
Indoor or outdoor use : Indoor
Temperature : < 40 °C

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

Product (article) characteristics
Covers percentage substance in the product up to 100 %.
Physical form of product : Liquid
Temperature : < 40 °C

Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Assumes a good basic standard of occupational hygiene is implemented Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Dermal - minimum efficiency of 0 % 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 specific activity training. Use suitable eye protection. Dermal - minimum efficiency of 95 % Inhalation - minimum efficiency of 0 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor
Temperature	:	< 40 °C

5.2.11. Control of worker exposure: ()

Product (article) characteristics		
Covers concentrations up to 50		
Physical form of product	:	Due to the viscosity, this product does not present an aspiration hazard.
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers use up to 240 min
Use frequency	:	Covers exposure up to 4 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Local exhaust ventilation Wash off any skin contamination immediately. Ensure there is no direct skin contact with product.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Avoid contact with skin and eyes. Wear suitable gloves tested to EN374. Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training. Wear safety goggles. Dermal - minimum efficiency of 95 %		

Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Professional or industrial settings	:	Industrial use
Temperature	:	Assumes process temperature up to 40 °C

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 rate	Release estimation method
Water	0,06 kg/day	FEICA SPERC 8c.1b.v1
Air	0 kg/day	FEICA SPERC 8c.1b.v1
Soil	0 %	FEICA SPERC 8c.1b.v1

Protection Target	Exposure estimate	RCR
Freshwater	3.22E-3mg/L (EUSES v2.1)	0,536
Freshwater sediment	0,155mg/L (EUSES v2.1)	0,454
Marine water	3.14E-4mg/L (EUSES v2.1)	0,523
Marine sediment	0,015mg/kg dry weight (EUSES v2.1)	0,442
Sewage treatment plant	0,028mg/L (EUSES v2.1)	< 0,01
Agricultural soil	0,05mg/kg dry weight (EUSES v2.1)	0,779
Predator's prey (freshwater)	0,048mg/kg wet weight (EUSES v2.1)	< 0,01
Predator's prey (marine water)	4.53E-3mg/kg wet weight (EUSES v2.1)	< 0,01
Top predator's prey (marine water)	1.64E-3mg/kg wet weight (EUSES v2.1)	< 0,01
Predator's prey (terrestrial)	0,056mg/kg wet weight (EUSES v2.1)	< 0,01
Man via environment - Inhalation	Concentration in air: 3.45E-11 mg/m³ (EUSES v2.1)	< 0,01
Man via environment - Oral	1.47E-3mg/kg bw/day (EUSES v2.1)	< 0,01
Man via the environment		< 0,01

5.3.2. Worker exposure: Industrial spraying (PROC7)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0,34mg/m³ (ART v1.5)	0,069
inhalative	local	long-term	0,34mg/m³ (ART v1.5)	
inhalative	local	short-term	0,78mg/m³ (ART v1.5)	
dermal	systemic	long-term	0,257mg/kg bw/day (ECETOC TRA worker v3)	0,343
dermal	local	short-term	0,012mg/cm2 (ECETOC TRA worker v3)	
dermal	local	short-term	0,012mg/cm2 (ECETOC TRA worker v3)	
combined routes				0,412

5.3.3. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0,851mg/m³ (ECETOC TRA worker v3)	0,173
inhalative	local	long-term	0,851mg/m³ (ECETOC TRA worker v3)	
inhalative	local	short-term	0,851mg/m³ (ECETOC TRA worker v3)	
dermal	systemic	long-term	0,411mg/kg bw/day (ECETOC TRA worker v3)	0,548
dermal	local	short-term	0,03mg/cm2 (ECETOC TRA worker v3)	
dermal	local	short-term	0,03mg/cm2 (ECETOC TRA worker v3)	
combined routes				0,721

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

Exposure route	Health effect	Exposure	Exposure	RCR

		indicator	estimate	
inhalative	systemic	long-term	0,085mg/m³ (ECETOC TRA worker v3)	0,017
inhalative	local	long-term	0,085mg/m³ (ECETOC TRA worker v3)	
inhalative	local	short-term	0,851mg/m³ (ECETOC TRA worker v3)	
dermal	systemic	long-term	0,411mg/kg bw/day (ECETOC TRA worker v3)	0,548
dermal	local	short-term	0,03mg/cm2 (ECETOC TRA worker v3)	
dermal	local	short-term	0,03mg/cm2 (ECETOC TRA worker v3)	
combined routes				0,566

5.3.5. 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
inhalative	systemic	long-term	0,099mg/m³ (ECETOC TRA worker v3)	0,02
inhalative	local	long-term	0,099mg/m³ (ECETOC TRA worker v3)	
inhalative	local	short-term	0,993mg/m³ (ECETOC TRA worker v3)	
dermal	systemic	long-term	0,343mg/kg bw/day (ECETOC TRA worker v3)	0,457
dermal	local	short-term	0,05mg/cm2 (ECETOC TRA worker v3)	
dermal	local	short-term	0,05mg/cm2 (ECETOC TRA worker v3)	
combined routes				0,659

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0,085mg/m³ (ECETOC TRA worker v3)	0,017
inhalative	local	long-term	0,085mg/m³ (ECETOC TRA worker v3)	
inhalative	local	short-term	0,085mg/m³ (ECETOC TRA worker v3)	
dermal	systemic	long-term	0,165mg/kg bw/day (ECETOC TRA worker v3)	0,219
dermal	local	short-term	0,012mg/cm2 (ECETOC TRA worker v3)	
dermal	local	short-term	0,012mg/cm2 (ECETOC TRA worker v3)	
combined routes				0,237

5.3.7. Worker exposure: Non-industrial spraying (PROC11)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0,34mg/m³ (ART v1.5)	0,069
inhalative	local	long-term	0,34mg/m³ (ART v1.5)	
inhalative	local	short-term	0,78mg/m³ (ART v1.5)	
dermal	systemic	long-term	0,643mg/kg bw/day (ECETOC TRA worker v3)	0,857
dermal	local	short-term	0,03mg/cm2 (ECETOC TRA worker v3)	
dermal	local	short-term	0,03mg/cm2 (ECETOC TRA worker v3)	
combined routes				0,926

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR

inhalative	systemic	long-term	0,085mg/m³ (ECETOC TRA worker v3)	0,017
inhalative	local	long-term	0,085mg/m³ (ECETOC TRA worker v3)	
inhalative	local	short-term	0,085mg/m³ (ECETOC TRA worker v3)	
dermal	systemic	long-term	0,411mg/kg bw/day (ECETOC TRA worker v3)	0,548
dermal	local	short-term	0,06mg/cm2 (ECETOC TRA worker v3)	
dermal	local	short-term	0,06mg/cm2 (ECETOC TRA worker v3)	
combined routes				0,566

5.3.9. Worker exposure: Tabletting, compression, extrusion, pelettisation, granulation (PROC14)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0,993mg/m³ (ECETOC TRA worker v3)	0,201
inhalative	local	long-term	0,993mg/m³ (ECETOC TRA worker v3)	
inhalative	local	short-term	0,993mg/m³ (ECETOC TRA worker v3)	
dermal	systemic	long-term	0,172mg/kg bw/day (ECETOC TRA worker v3)	0,229
dermal	local	short-term	0.0025mg/cm2 (ECETOC TRA worker v3)	
dermal	local	short-term	0.0025mg/cm2 (ECETOC TRA worker v3)	
combined routes				0,43

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR

inhalative	systemic	long-term	0,993mg/m³ (ECETOC TRA worker v3)	0,201
inhalative	local	long-term	0,993mg/m³ (ECETOC TRA worker v3)	
inhalative	local	short-term	0,993mg/m³ (ECETOC TRA worker v3)	
dermal	systemic	long-term	0,172mg/kg bw/day (ECETOC TRA worker v3)	0,045
dermal	local	short-term	9.92E-3 mg/cm² (TRA Workers)mg/cm2 (ECETOC TRA worker v3)	
dermal	local	short-term	9.92E-3 mg/cm² (TRA Workers)mg/cm2 (ECETOC TRA worker v3)	
combined routes				0,247

5.3.11. Worker exposure: ()

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0,300mg/m³ (ECETOC TRA worker v3)	0,061
inhalative	local	long-term	0,300mg/m³ (ECETOC TRA worker v3)	
inhalative	local	short-term	mg/m³ (ECETOC TRA worker v3)	
dermal	systemic	long-term	0,141mg/kg bw/day (ECETOC TRA worker v3)	0,189
dermal	local	short-term	mg/cm2 (ECETOC TRA worker v3)	
dermal	local	short-term	mg/cm2 (ECETOC TRA worker v3)	
combined routes				0,249

5.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES
Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

ES 6: Use at industrial sites:, Use of lubricants in high energy open processes.; Professional uses: Public domain (administration, education, entertainment, services, craftsmen) (SU 22).

6.1. Title section

Exposure Scenario name	:	Use at industrial sites:, Use of lubricants in high energy open processes.
Structured Short Title	:	; Professional uses: Public domain (administration, education, entertainment, services, craftsmen) (SU 22).

Environment		
CS 1	**Use of non-reactive processing aid at industrial site (no inclusion into or onto article)**	ERC4
Worker		
CS 2	**General greasing/lubrication at high kinetic energy conditions**	PROC18

CS 3	**Lubrication at high energy conditions in metal working operations**	PROC17

6.2. Conditions of use affecting exposure

6.2.1. 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		
Daily amount per site	:	0,6 tonnes/day
Annual amount per site	:	20 tonnes/year
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
Additional information on STP	:	Biological elimination
STP sludge treatment	:	Can be landfilled, when in compliance with local regulations.
STP effluent	:	2 000 m3/d
Other conditions affecting environmental exposure		
Receiving surface water flow	:	18 000 m3/d

Indoor or outdoor use	:	Indoor use

6.2.2. Control of worker exposure: General greasing/lubrication at high kinetic energy conditions (PROC18)

Product (article) characteristics		
Covers concentrations up to 20 %		
Physical form of product	:	Liquid
Temperature	:	<= 800 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Use suitable eye protection. Dermal - minimum efficiency of 95 % Inhalation - minimum efficiency of 0 %		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Outdoor
Professional or industrial settings	:	Professional use
Temperature	:	<= 800 °C

6.2.3. Control of worker exposure: Lubrication at high energy conditions in metal working operations (PROC17)

Product (article) characteristics		
Covers concentrations up to 20 %		
Physical form of product	:	Liquid
Temperature	:	<= 800 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Provide a good standard of controlled ventilation (5 to 10 air changes per hour). Dermal - minimum efficiency of 0 % 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. Use suitable eye protection. Dermal - minimum efficiency of 95 % Inhalation - minimum efficiency of 0 %
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %
Wear suitable coveralls to prevent exposure to the skin.

Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Professional or industrial settings	:	Professional use
Temperature	:	<= 800 °C

6.3. Exposure estimation and reference to its source

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

Release route	Release rate	Release estimation method
Water	1.2E-10kg/day	FEICA SPERC 5.1a.v1
Air	3E-4kg/day	FEICA SPERC 5.1a.v1
Soil	0%	FEICA SPERC 5.1a.v1

Protection Target	Exposure estimate	RCR
Freshwater	3.76E-4mg/L (EUSES v2.1)	0,063
Freshwater sediment	0,018mg/L (EUSES v2.1)	0,053
Marine water	2.95E-5mg/kg dry weight (EUSES v2.1)	0,049
Marine sediment	1.42E-3mg/kg dry weight (EUSES v2.1)	0,042
Sewage treatment plant	5.68E-11mg/L (EUSES v2.1)	< 0,01
Agricultural soil	2.88E-6mg/kg dry weight (EUSES v2.1)	< 0,01
Predator's prey (freshwater)	mg/kg wet weight (EUSES v2.1)	< 0,01
Predator's prey (marine water)	9.13E-4mg/kg wet weight (EUSES v2.1)	< 0,01
Top predator's prey (marine water)	9.13E-4mg/kg wet weight (EUSES v2.1)	< 0,01
Predator's prey (terrestrial)	1.68E-4mg/kg wet weight	< 0,01

	(EUSES v2.1)	
Man via environment - Inhalation	7.65E-9mg/m³ (EUSES v2.1)	< 0,01
Man via environment - Oral	3E-5mg/kg bw/day (EUSES v2.1)	< 0,01
Man via the environment		< 0,01

6.3.2. Worker exposure: General greasing/lubrication at high kinetic energy conditions (PROC18)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0,596mg/m³ (ECETOC TRA worker v3)	0,121
inhalative	local	long-term	0,596mg/m³ (ECETOC TRA worker v3)	
inhalative	local	short-term	0,596mg/m³ (ECETOC TRA worker v3)	
dermal	systemic	long-term	0,411mg/kg bw/day (ECETOC TRA worker v3)	0,548
dermal	local	short-term	0,03mg/cm2 (ECETOC TRA worker v3)	
dermal	local	short-term	0,03mg/cm2 (ECETOC TRA worker v3)	
combined routes				0,669

6.3.3. Worker exposure: Lubrication at high energy conditions in metal working operations (PROC17)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	4,255mg/m³ (ECETOC TRA worker v3)	0,863
inhalative	local	long-term	4,255mg/m³ (ECETOC TRA worker v3)	
inhalative	local	short-term	102,1mg/m³ (ECETOC TRA worker v3)	
dermal	systemic	long-term	3.4E-3 mg/kg bw/day (easyTRA V4.2.0.5071)mg/kg bw/day (ECETOC	< 0,01

			TRA worker v3)	
dermal	local	short-term	0,06mg/cm2 (ECETOC TRA worker v3)	
dermal	local	short-term	0,06mg/cm2 (ECETOC TRA worker v3)	
combined routes				0,868

6.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES
Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

ES 7: Professional application of coatings and inksAdhesives, sealants (PC1); Professional uses (SU22).Coatings and paints, thinners, paint removers (PC9a); Professional uses (SU22).Fillers, putties, plasters, modelling clay (PC9b); Professional uses (SU22).

7.1. Title section

Exposure Scenario name	:	Professional application of coatings and inks
Structured Short Title	:	Adhesives, sealants (PC1); Professional uses (SU22).Coatings and paints, thinners, paint removers (PC9a); Professional uses (SU22).Fillers, putties, plasters, modelling clay (PC9b); Professional uses (SU22).

Environment		
CS 1	**Widespread use leading to inclusion into/onto article (indoor)**	ERC8c
CS 2	**Widespread use leading to inclusion into/onto article (outdoor)**	ERC8f
Worker		
CS 3	**Mixing or blending in batch processes**	PROC5
CS 4	**Transfer of substance or mixture (charging/discharging) at non dedicated-facilities**	PROC8a
CS 5	**Transfer of substance or mixture (charging/discharging) at dedicated facilities**	PROC8b
CS 6	**Roller application or brushing**	PROC10
CS 7	**Non-industrial spraying**	PROC11
CS 8	**Treatment of articles by dipping and pouring**	PROC13
CS 9	**Use as laboratory reagent**	PROC15
CS 10	**Manual activities involving hand contact**	PROC19
CS 11	**Manual activities involving hand contact**	PROC19
CS 12	**Non-industrial spraying**	PROC11

7.2. Conditions of use affecting exposure

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Daily amount per site	:	0,05 tonnes/day
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
Indoor or outdoor use	:	Indoor use

7.2.2. Control of environmental exposure: Widespread use leading to inclusion into/onto article (outdoor) (ERC8f)

Product (article) characteristics		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Daily amount per site	:	0,05 tonnes/day
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
Additional information on STP	:	Biological elimination
STP sludge treatment	:	Can be landfilled, when in compliance with local regulations.
STP effluent	:	2 000 m3/d
Other conditions affecting environmental exposure		
Receiving surface water flow	:	18 000 m3/d
Indoor or outdoor use	:	Outdoor use

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

Product (article) characteristics		
Covers concentrations up to 25 %		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Provide a good standard of controlled ventilation (5 to 10 air changes per hour).		
Ensure operatives are trained to minimise exposures.		
Identify potential areas for indirect skin contact.		
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 99,5 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Professional or industrial settings	:	Professional use
Temperature	:	Assumes process temperature up to 40 °C

7.2.4. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)

Product (article) characteristics		
Covers percentage substance in the product up to 25 %.		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Use suitable eye protection. Dermal - minimum efficiency of 95 % Inhalation - minimum efficiency of 0 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Outdoor

Professional or industrial settings	:	Professional use
Temperature	:	Assumes process temperature up to < 40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 25 %.		
Physical form of product	:	Liquid
Vapour pressure	:	0,00741 Pa
Temperature	:	70 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Conditions and measures related to personal protection, hygiene and health evaluation		
Use suitable eye protection.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor
Temperature	:	70 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 25 %.		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Ensure operatives are trained to minimise exposures.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Use suitable eye protection. Dermal - minimum efficiency of 99 % Inhalation - minimum efficiency of 0 %		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		

Other conditions affecting workers exposure		
Indoor or outdoor use	:	Outdoor
Professional or industrial settings	:	Professional use
Temperature	:	Assumes process temperature up to < 40 °C

7.2.7. Control of worker exposure: Non-industrial spraying (PROC11)

Product (article) characteristics		
Covers percentage substance in the product up to 25 %.		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Dermal - minimum efficiency of 0 % 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 specific activity training. Use suitable eye protection. Dermal - minimum efficiency of 99 % Inhalation - minimum efficiency of 0 %		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 95 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Professional or industrial settings	:	Professional use
Temperature	:	Assumes process temperature up to < 40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 25 %.		
Physical form of product	:	Liquid
Vapour pressure	:	0,00741 Pa
Temperature	:	< 70 °C

Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Use suitable eye protection. Dermal - minimum efficiency of 95 % Inhalation - minimum efficiency of 0 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Professional or industrial settings	:	Professional use
Temperature	:	< 70 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Vapour pressure	:	0,00741 Pa
Temperature	:	< 70 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Assumes a good basic standard of occupational hygiene is implemented Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % 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 specific activity training. Use suitable eye protection. Dermal - minimum efficiency of 90 % Inhalation - minimum efficiency of 0 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Professional use
Temperature	:	< 70 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Vapour pressure	:	0,00741 Pa
Temperature	:	< 70 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Assumes a good basic standard of occupational hygiene is implemented Local exhaust ventilation Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 80 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Use suitable eye protection. Dermal - minimum efficiency of 99 % Inhalation - minimum efficiency of 0 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Professional use
Temperature	:	< 70 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Vapour pressure	:	0,00741 Pa
Temperature	:	< 70 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours

Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Use suitable eye protection. Dermal - minimum efficiency of 99 % Inhalation - minimum efficiency of 0 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm^2)
Indoor or outdoor use	:	Outdoor
Professional or industrial settings	:	Professional use
Temperature	:	< 70 °C

7.2.12. Control of worker exposure: Non-industrial spraying (PROC11)

Product (article) characteristics		
Covers percentage substance in the product up to 25 %.		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Dermal - minimum efficiency of 0 % 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 specific activity training. Use suitable eye protection. Dermal - minimum efficiency of 99 % Inhalation - minimum efficiency of 0 %		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Professional or industrial settings	:	Professional use
Temperature	:	Assumes process temperature up to < 40 °C

7.3. Exposure estimation and reference to its source

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

Release route	Release rate	Release estimation method
Water	0,06 kg/day	
Air	0 %	
Soil	0 %	

Protection Target	Exposure estimate	RCR
Freshwater	3.22E-3mg/L (EUSES v2.1)	0,536
Freshwater sediment	0,155mg/kg dry weight (EUSES v2.1)	0,454
Marine water	3.14E-4mg/L (EUSES v2.1)	0,523
Marine sediment	0,015mg/kg dry weight (EUSES v2.1)	0,042
Sewage treatment plant	0,028mg/L (EUSES v2.1)	< 0,01
Agricultural soil	0,05mg/kg dry weight (EUSES v2.1)	0,779
Predator's prey (freshwater)	0,056mg/kg wet weight (EUSES v2.1)	< 0,01
Predator's prey (marine water)	5.32E-3mg/kg wet weight (EUSES v2.1)	< 0,01
Top predator's prey (marine water)	1.79E-3mg/kg wet weight (EUSES v2.1)	< 0,01
Predator's prey (terrestrial)	0,056mg/kg wet weight (EUSES v2.1)	< 0,01
Man via environment - Inhalation	3.47E-11mg/m³ (EUSES v2.1)	< 0,01
Man via environment - Oral	1.5E-3mg/kg bw/day (EUSES v2.1)	< 0,01
Man via the environment	(EUSES v2.1)	< 0,01

7.3.2. Environmental release and exposure: Widespread use leading to inclusion into/onto article (outdoor) (ERC8f)

Release route	Release rate	Release estimation method
Water	0,06 kg/day	FEICA SPERC 5.1a.v1
Air	0%	FEICA SPERC 5.1a.v1
Soil	0.5%	FEICA SPERC 5.1a.v1

Protection Target	Exposure estimate	RCR
Freshwater	3.22E-3mg/L (EUSES v2.1)	0,536
Freshwater sediment	0,155mg/L (EUSES v2.1)	0,454
Marine water	3.14E-4mg/kg dry weight (EUSES v2.1)	0,523
Marine sediment	0,015mg/kg dry weight (EUSES v2.1)	0,442
Sewage treatment plant	0,028mg/L (EUSES v2.1)	< 0,01
Agricultural soil	0,05mg/kg dry weight (EUSES v2.1)	0,779
Predator's prey (freshwater)	0,056mg/kg wet weight (EUSES v2.1)	< 0,01
Predator's prey (marine water)	5.32E-3mg/kg wet weight (EUSES v2.1)	< 0,01
Top predator's prey (marine water)	1.79E-3mg/kg wet weight (EUSES v2.1)	< 0,01
Predator's prey (terrestrial)	0,056mg/kg wet weight (EUSES v2.1)	< 0,01
Man via environment - Inhalation	3.47E-11 (EUSES v2.1)	< 0,01
Man via environment - Oral	1.5E-3mg/kg bw/day (EUSES v2.1)	< 0,01
Man via the environment		< 0,01

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0,596mg/m³ (EASYTRA)	0,121
inhalative	local	long-term	0,596mg/m³ (EASYTRA)	
inhalative	local	short-term	0,596mg/m³ (EASYTRA)	
dermal	systemic	long-term	0,041mg/kg bw/day (EASYTRA)	0,548
dermal	local	long-term	0,03	
dermal	local	short-term	0,03	
combined routes			(EASYTRA)	0,669

7.3.4. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR

inhalative	systemic	long-term	0,596mg/m³ (ECETOC TRA worker v3)	0,121
inhalative	local	long-term	0,596mg/m³ (ECETOC TRA worker v3)	
inhalative	local	short-term	0,596mg/m³ (ECETOC TRA worker v3)	
dermal	systemic	long-term	0,411mg/kg bw/day (ECETOC TRA worker v3)	0,548
dermal	local	short-term	0,03mg/cm2 (ECETOC TRA worker v3)	
dermal	local	short-term	0,03mg/cm2 (ECETOC TRA worker v3)	
combined routes				0,669

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0,596mg/m³ (EASYTRA)	0,121
inhalative	local	long-term	0,596mg/m³ (EASYTRA)	
inhalative	local	short-term	0,596mg/m³ (EASYTRA)	
dermal	systemic	long-term	0,041mg/kg bw/day (EASYTRA)	0,548
dermal	local	long-term	0,03	
dermal	local	short-term	0,03	
combined routes			(EASYTRA)	0,669

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0,059mg/m³ (ECETOC TRA worker v3)	0,012
inhalative	local	long-term	0,059mg/m³ (ECETOC TRA worker v3)	

inhalative	local	short-term	0,17mg/m³ (ECETOC TRA worker v3)	
dermal	systemic	long-term	0,165mg/kg bw/day (ECETOC TRA worker v3)	0,219
dermal	local	short-term	0,012mg/cm2 (ECETOC TRA worker v3)	
dermal	local	short-term	0,012mg/cm2 (ECETOC TRA worker v3)	
combined routes				0,231

7.3.7. Worker exposure: Non-industrial spraying (PROC11)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0,295mg/m³ (ECETOC TRA worker v3)	0,06
inhalative	local	long-term	0,295mg/m³ (ECETOC TRA worker v3)	
inhalative	local	short-term	0,85mg/m³ (ECETOC TRA worker v3)	
dermal	systemic	long-term	0,643mg/kg bw/day (ECETOC TRA worker v3)	0,857
dermal	local	short-term	0,03mg/cm2 (ECETOC TRA worker v3)	
dermal	local	short-term	0,03mg/cm2 (ECETOC TRA worker v3)	
combined routes				0,917

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0,569mg/m³ (ECETOC TRA worker v3)	0,121
inhalative	local	long-term	0,569mg/m³ (ECETOC TRA worker v3)	

inhalative	local	short-term	0,569mg/m³ (ECETOC TRA worker v3)	
dermal	systemic	long-term	0,411mg/kg bw/day (ECETOC TRA worker v3)	0,548
dermal	local	short-term	0,06mg/cm2 (ECETOC TRA worker v3)	
dermal	local	short-term	0,06mg/cm2 (ECETOC TRA worker v3)	
combined routes				0,669

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0,993mg/m³ (ECETOC TRA worker v3)	0,201
inhalative	local	long-term	0,993mg/m³ (ECETOC TRA worker v3)	
inhalative	local	short-term	0,993mg/m³ (ECETOC TRA worker v3)	
dermal	systemic	long-term	0,034mg/kg bw/day (ECETOC TRA worker v3)	0,045
dermal	local	short-term	9.92E-3 mg/cm² (TRA Workers)mg/cm2 (ECETOC TRA worker v3)	
dermal	local	short-term	9.92E-3 mg/cm² (TRA Workers)mg/cm2 (ECETOC TRA worker v3)	
combined routes				0,247

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0,17mg/m³ (ECETOC TRA worker v3)	0,034

inhalative	local	long-term	0,17mg/m³ (ECETOC TRA worker v3)	
inhalative	local	short-term	0,17mg/m³ (ECETOC TRA worker v3)	
dermal	systemic	long-term	0,411mg/kg bw/day (ECETOC TRA worker v3)	0,549
dermal	local	short-term	0,03mg/cm2 (ECETOC TRA worker v3)	
dermal	local	short-term	0,03mg/cm2 (ECETOC TRA worker v3)	
combined routes				0,583

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0,059mg/m³ (ECETOC TRA worker v3)	0,012
inhalative	local	long-term	0,059mg/m³ (ECETOC TRA worker v3)	
inhalative	local	short-term	0,059mg/m³ (ECETOC TRA worker v3)	
dermal	systemic	long-term	0,411mg/kg bw/day (ECETOC TRA worker v3)	0,549
dermal	local	short-term	0,03mg/cm2 (ECETOC TRA worker v3)	
dermal	local	short-term	0,03mg/cm2 (ECETOC TRA worker v3)	
combined routes				0,561

7.3.12. Worker exposure: Non-industrial spraying (PROC11)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0,34mg/m³ (ECETOC TRA worker v3)	0,069

inhalative	local	long-term	0,34mg/m³ (ECETOC TRA worker v3)	
inhalative	local	short-term	0,78mg/m³ (ECETOC TRA worker v3)	
dermal	systemic	long-term	0,643mg/kg bw/day (ECETOC TRA worker v3)	0,857
dermal	local	short-term	0,03mg/cm2 (ECETOC TRA worker v3)	
dermal	local	short-term	0,03mg/cm2 (ECETOC TRA worker v3)	
combined routes				0,926

7.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES
Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

ES 8: Consumer use

8.1. Title section

Exposure Scenario name	:	Consumer use

Environment		
CS 1	**Wide dispersive indoor use resulting in inclusion into or onto a matrix**	ERC8c
CS 2	**Widespread use leading to inclusion into/onto article (outdoor)**	ERC8f
Consumer		
CS 3	**Two component glue, Mixing and loading**	PC1
CS 4	**Two component glue, Application**	PC1
CS 5	**Coatings and paints, thinners, paint removers, Mixing and loading**	PC9a
CS 6	**Coatings and paints, thinners, paint removers, Application**	PC9a
CS 7	**Fillers, putties, plasters, modelling clay, Mixing and loading**	PC9b
CS 8	**Fillers, putties, plasters, modelling clay, Application of adhesives.**	PC9b

8.2. Conditions of use affecting exposure

8.2.1. Control of environmental exposure: Wide dispersive indoor use resulting in inclusion into or onto a matrix (ERC8c)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Low volatile liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Daily amount for wide disperse uses	:	0,001 tonnes/year
Other conditions affecting environmental exposure		
Receiving surface water flow	:	18 000 m3/d
Local freshwater dilution factor	:	10

Local marine water dilution factor	:	100
Indoor or outdoor use	:	Indoor use

8.2.2. Control of environmental exposure: Widespread use leading to inclusion into/onto article (outdoor) (ERC8f)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Low volatile liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Daily amount for wide disperse uses	:	0,001 tonnes/year
Release type	:	Continuous release
Emission days	:	365
Other conditions affecting environmental exposure		
Receiving surface water flow	:	18 000 m3/d
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100
Indoor or outdoor use	:	Outdoor use

8.2.3. Control of consumer exposure: Adhesives, sealants (PC1)

Product (article) characteristics		
Covers concentrations up to 45 %		
Physical form of product	:	Liquid substance
Vapour pressure	:	Vapour pressure < 0.01 Pa at standard temperature and pressure
Amount used (or contained in articles), frequency and duration of use/exposure		
Amount per use	:	20 g
Use frequency	:	Use frequency 3 times per year
Conditions and measures related to personal protection, hygiene and health evaluation		
No specific measures identified.		
Other conditions affecting consumers exposure		
Body parts exposed	:	Assumes that potential dermal contact is limited to fingertips.
Indoor or outdoor use	:	Indoor use

Room size	:	Assumes a room volume of maximum 20 m3
Temperature	:	20 °C

8.2.4. Control of consumer exposure: Adhesives, sealants (PC1)

Product (article) characteristics		
Covers concentrations up to 45 %		
Physical form of product	:	Liquid substance
Vapour pressure	:	Vapour pressure < 0.01 Pa at standard temperature and pressure
Amount used (or contained in articles), frequency and duration of use/exposure		
Amount used per event	:	20 g
Use frequency	:	Use frequency 3 times per year
Other conditions affecting consumers exposure		
Body parts exposed	:	Assumes that potential dermal contact is limited to fingertips.
Indoor or outdoor use	:	Indoor use
Room size	:	Covers use in room size of 20 m3
Temperature	:	20 °C

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

Product (article) characteristics		
Covers concentrations up to 35 %		
Physical form of product	:	Liquid substance
Vapour pressure	:	Vapour pressure < 0.01 Pa at standard temperature and pressure
Amount used (or contained in articles), frequency and duration of use/exposure		
For each use event, covers use amounts up to	:	2250 g
Use frequency	:	Use frequency 0,33 times per year
Other conditions affecting consumers exposure		
Body parts exposed	:	Assumes that potential dermal contact is limited to fingertips.
Indoor or outdoor use	:	Indoor use
Temperature	:	20 °C

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

Product (article) characteristics		
Covers concentrations up to 35 %		
Physical form of product	:	Liquid substance
Vapour pressure	:	Vapour pressure < 0.01 Pa at standard temperature and pressure
Amount used (or contained in articles), frequency and duration of use/exposure		
Amount used per event	:	0,001 g
Use frequency	:	Use frequency 2 times per year
Other conditions affecting consumers exposure		
Body parts exposed	:	Both hands (860 cm^2)
Indoor or outdoor use	:	Indoor use
Room size	:	20 m3
Temperature	:	20 °C

8.2.7. Control of consumer exposure: Fillers, putties, plasters, modelling clay (PC9b)

Product (article) characteristics		
Covers concentrations up to 45 %		
Physical form of product	:	Liquid substance
Vapour pressure	:	Vapour pressure < 0.01 Pa at standard temperature and pressure
Amount used (or contained in articles), frequency and duration of use/exposure		
For each use event, covers use amounts up to	:	200 g
Use frequency	:	Use frequency 2 times per year
Other conditions affecting consumers exposure		
Body parts exposed	:	Assumes that potential dermal contact is limited to fingertips.
Indoor or outdoor use	:	Indoor use
Room size	:	20 m3
Temperature	:	20 °C

8.2.8. Control of consumer exposure: Fillers, putties, plasters, modelling clay (PC9b)

Product (article) characteristics
Covers concentrations up to 45 %

Physical form of product	:	Liquid substance
Vapour pressure	:	Vapour pressure < 0.01 Pa at standard temperature and pressure
Amount used (or contained in articles), frequency and duration of use/exposure		
For each use event, covers use amounts up to	:	200 g
Use frequency	:	Use frequency 2 times per year
Other conditions affecting consumers exposure		
Body parts exposed	:	Assumes that potential dermal contact is limited to fingertips.
Indoor or outdoor use	:	Indoor use
Room size	:	20 m3
Temperature	:	20 °C

8.3. Exposure estimation and reference to its source

8.3.1. Environmental release and exposure: Wide dispersive indoor use resulting in inclusion into or onto a matrix (ERC8c)

Release route	Release rate	Release estimation method
Water	0,015 kg/day	FEICA SPERC 8c.1b.v1
Air	0 kg/day	FEICA SPERC 8c.1b.v1
Soil	0 kg/day	FEICA SPERC 8c.1b.v1

Protection Target	Exposure estimate	RCR
Freshwater	1.09E-3mg/L (EUSES v2.1)	0,181
Freshwater sediment	0,052mg/kg dry weight (EUSES v2.1)	0,153
Marine water	1E-4mg/L (EUSES v2.1)	0,167
Marine sediment	4.83E-3mg/kg dry weight (EUSES v2.1)	0,142
Sewage treatment plant	7.11E-3mg/L (EUSES v2.1)	< 0,01
Agricultural soil	0,013mg/kg dry weight (EUSES v2.1)	0,195
Predator's prey (freshwater)	0,023mg/kg wet weight (EUSES v2.1)	< 0,01
Predator's prey (marine water)	2.01E-3mg/kg wet weight (EUSES v2.1)	< 0,01

Predator's prey (terrestrial)	0,014mg/kg wet weight (EUSES v2.1)	< 0,01
Top predator's prey (marine water)	1.13E-3mg/kg wet weight (EUSES v2.1)	< 0,01
Man via environment - Inhalation	3.44E-11mg/m³ (EUSES v2.1)	< 0,01
Man via environment - Oral	3.89E-4mg/kg bw/day (EUSES v2.1)	< 0,01
Man via the environment	(EUSES v2.1)	< 0,01

8.3.2. Environmental release and exposure: Widespread use leading to inclusion into/onto article (outdoor) (ERC8f)

Release route	Release rate	Release estimation method
Water	0,015 kg/day	FEICA SPERC 8c.1b.v1
Air	0 kg/day	FEICA SPERC 8c.1b.v1
Soil	0 kg/day	FEICA SPERC 8c.1b.v1

Protection Target	Exposure estimate	RCR
Freshwater	1.09E-3mg/L (EUSES v2.1)	0,181
Freshwater sediment	0,052mg/kg dry weight (EUSES v2.1)	0,153
Marine water	1E-4mg/L (EUSES v2.1)	0,167
Marine sediment	4.83E-3mg/kg dry weight (EUSES v2.1)	0,142
Sewage treatment plant	7.11E-3mg/L (EUSES v2.1)	< 0,01
Agricultural soil	0,013mg/kg dry weight (EUSES v2.1)	0,195
Predator's prey (freshwater)	0,023mg/kg wet weight (EUSES v2.1)	< 0,01
Predator's prey (marine water)	2.01E-3mg/kg wet weight (EUSES v2.1)	< 0,01
Predator's prey (terrestrial)	0,014mg/kg wet weight (EUSES v2.1)	< 0,01
Top predator's prey (marine water)	1.13E-3mg/kg wet weight (EUSES v2.1)	< 0,01
Man via environment - Inhalation	3.44E-11mg/m³ (EUSES v2.1)	< 0,01
Man via environment - Oral	3.89E-4mg/kg bw/day (EUSES v2.1)	< 0,01
Man via the environment	(EUSES v2.1)	< 0,01

8.3.3. Consumer exposure: Adhesives, sealants (PC1)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	4.5E-9 mg/m³ (ConsExpo web 1.0.6)	< 0,01
inhalative	local	long-term	4.5E-9 mg/m³ (ConsExpo web 1.0.6)	
inhalative	local	short-term	4.5E-9 mg/m³ (ConsExpo web 1.0.6)	
dermal	systemic	long-term	6.9E-3 mg/kg bw/day (ConsExpo web 1.0.6)mg/kg bw/day	0,077
dermal	local	long-term	0,22mg/cm2	
dermal	local	short-term	0,22mg/cm2	
oral	systemic	long-term	0mg/kg bw/day	< 0,01
combined routes				0,077

8.3.4. Consumer exposure: Adhesives, sealants (PC1)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	1.3E-7 mg/m³ (ConsExpo web 1.0.6)	< 0,01
inhalative	local	long-term	1.3E-7 mg/m³ (ConsExpo web 1.0.6)	
inhalative	local	short-term	2E-7 mg/m³ (ConsExpo web 1.0.6)	
dermal	systemic	long-term	6.9E-3 mg/kg bw/day (ConsExpo web 1.0.6)mg/kg bw/day	0,077
dermal	local	long-term	0,22mg/cm2	
dermal	local	short-term	0,22mg/cm2	
oral	systemic	long-term	0mg/kg bw/day	< 0,01
combined routes				0,077

8.3.5. Consumer exposure: Coatings and paints, thinners, paint removers (PC9a)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	2E-8 mg/m³ (ConsExpo web 1.0.6)	< 0,01
inhalative	local	long-term	2E-8 mg/m³ (ConsExpo web 1.0.6)	
inhalative	local	short-term	2E-8 mg/m³ (ConsExpo web 1.0.6)	
dermal	systemic	long-term	5.4E-3 mg/kg bw/day (ConsExpo web 1.0.6)mg/kg bw/day	0,06
dermal	local	long-term	8.1E-4 mg/cm² (ConsExpo web 1.0.6)mg/cm2	
dermal	local	short-term	8.1E-4 mg/cm² (ConsExpo web 1.0.6)mg/cm2	
oral	systemic	long-term	0mg/kg bw/day	< 0,01
combined routes				0,06

8.3.6. Consumer exposure: Coatings and paints, thinners, paint removers (PC9a)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	6.9E-7 mg/m³ (ConsExpo web 1.0.6)	< 0,01
inhalative	local	long-term	6.9E-7 mg/m³ (ConsExpo web 1.0.6)	
inhalative	local	short-term	6.9E-7 mg/m³ (ConsExpo web 1.0.6)	
dermal	systemic	long-term	5.4E-3 mg/kg bw/day (ConsExpo web 1.0.6)mg/kg bw/day	0,06
dermal	local	long-term	4.1E-4 mg/cm² (ConsExpo web 1.0.6)mg/cm2	
dermal	local	short-term	4.1E-4 mg/cm²	

			(ConsExpo web 1.0.6)mg/cm2	
oral	systemic	long-term	0mg/kg bw/day	< 0,01
combined routes				0,06

8.3.7. Consumer exposure: Fillers, putties, plasters, modelling clay (PC9b)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	2.3E-8 mg/m³ (ConsExpo web 1.0.6)	< 0,01
inhalative	local	long-term	2.3E-8 mg/m³ (ConsExpo web 1.0.6)	
inhalative	local	short-term	2.3E-8 mg/m³ (ConsExpo web 1.0.6)	
dermal	systemic	long-term	6.9E-3 mg/kg bw/day (ConsExpo web 1.0.6)mg/kg bw/day	0,077
dermal	local	long-term	0,22mg/cm2	
dermal	local	short-term	0,22mg/cm2	
oral	systemic	long-term	0mg/kg bw/day	< 0,01
combined routes				0,077

8.3.8. Consumer exposure: Fillers, putties, plasters, modelling clay (PC9b)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	1.3E-8 mg/m³ (ConsExpo web 1.0.6)	< 0,01
inhalative	local	long-term	1.3E-8 mg/m³ (ConsExpo web 1.0.6)	
inhalative	local	short-term	2E-8 mg/m³ (ConsExpo web 1.0.6)	
dermal	systemic	long-term	6.9E-3 mg/kg bw/day (ConsExpo web 1.0.6)mg/kg bw/day	0,077
dermal	local	long-term	0,22mg/cm2	

dermal	local	short-term	0,22mg/cm2	
oral	systemic	long-term	0mg/kg bw/day	< 0,01
combined routes				0,077

8.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES
Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.