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

1.1 Product identifier

Trade name : ARADUR® HY 951

Substance name : Amines, polyethylenepoly-, triethylenetetramine fraction

EC-No. : 292-588-2

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

Use of the Substance/Mixture : Intermediate
Hardener
Component used for the manufacture of electrical insulation parts
- IDENTIFIED USES -

ES1: Formulation;, Ashless Dispersant. Industrial uses
ES2: Formulation;, Diesel and gasoline additive. Industrial uses
ES3: Formulation;, Wood preservatives Industrial uses
ES4: Formulation;, Epoxy curing agent. Industrial uses
ES5: Formulation;, Epoxy curing agent in paint. Industrial uses
ES6: Formulation;, Coatings, adhesives, inks. Industrial uses
ES7: Use at industrial sites:, Ashless Dispersant. Industrial uses
ES8: Use at industrial sites:, Diesel and gasoline additive. Industrial uses
ES9: Use at industrial sites:, Wood preservatives Industrial uses
ES10: Use at industrial sites:, Epoxy curing agent. Industrial uses
ES11: Use at industrial sites:, Epoxy curing agent in paint. Industrial uses
ES12: Use at industrial sites:, Processing aid Industrial uses
ES13: Use at industrial sites:, Coatings, adhesives, inks. Industrial uses
ES14: Use as laboratory chemical. Industrial uses

1.3 Details of the supplier of the safety data sheet

Company : Huntsman Advanced Materials (Europe)BVBA
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 : 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) as amended by GB-CLP Regulation, UK SI 2019/720, and UK SI 2020/1567)

Acute toxicity, Category 4	H302: Harmful if swallowed.
Acute toxicity, Category 4	H312: Harmful in contact with skin.
Skin corrosion, Sub-category 1B	H314: Causes severe skin burns and eye damage.
Serious eye damage, Category 1	H318: Causes serious eye damage.
Skin sensitisation, Category 1	H317: May cause an allergic skin reaction.
Long-term (chronic) aquatic hazard, Category 3	H412: Harmful to aquatic life with long lasting effects.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008) as amended by GB-CLP Regulation, UK SI 2019/720, and UK SI 2020/1567)

Hazard pictograms :

Signal word : Danger

Hazard statements :
H302 + H312 Harmful if swallowed or in contact with skin.
H314 Causes severe skin burns and eye damage.
H317 May cause an allergic skin reaction.
H412 Harmful to aquatic life with long lasting effects.

Precautionary statements :

Prevention:

P261 Avoid breathing mist or vapours.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.

Response:

P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if

present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.

2.3 Other hazards

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

SECTION 3: Composition/information on ingredients

3.1 Substances

Substance name : Amines, polyethylenepoly-, triethylenetetramine fraction

EC-No. : 292-588-2

Hazardous components

Chemical name	CAS-No. EC-No.	Concentration (% w/w)	M-Factor, SCL, ATE
Amines, polyethylenepoly-, triethylenetetramine fraction	90640-67-8 292-588-2	>= 90 - <= 100	

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice : Move out of dangerous area.
Consult a physician.
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 : Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and with difficulty.
If on skin, rinse well with water.
If on clothes, remove clothes.

In case of eye contact : Small amounts splashed into eyes can cause irreversible

tissue damage and blindness.
In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Continue rinsing eyes during transport to hospital.
Remove contact lenses.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.

If swallowed : Keep respiratory tract clear.
Do NOT induce vomiting.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.
Take victim immediately to hospital.

4.2 Most important symptoms and effects, both acute and delayed

None known.

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 : Ammonia
Carbon oxides
Nitrogen oxides (NOx)

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 : Neutralise with acid.
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.
To avoid spills during handling keep bottle on a metal tray.
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. Observe label precautions. Keep in properly labelled containers.
Advice on common storage	:	Do not store near acids.
Recommended storage temperature	:	2 - 40 °C
Further information on storage stability	:	Stable under normal conditions.

7.3 Specific end use(s)

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

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
Amines, polyethylenepoly-, triethylenetetramine fraction	Workers	Inhalation	Long-term systemic effects	0.54 mg/m3
	Consumers	Inhalation	Long-term systemic effects	0.096 mg/m3
	Consumers	Oral	Long-term systemic effects	14 mg/kg bw/day

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

Substance name	Environmental Compartment	Value
Amines, polyethylenepoly-, triethylenetetramine fraction	Fresh water	0.027 mg/l
	Marine water	0.003 mg/l
	Sewage treatment plant	0.13 mg/l
	Fresh water sediment	8.572 mg/kg dry weight (d.w.)
	Marine sediment	0.857 mg/kg dry weight (d.w.)
	Soil	1.25 mg/kg dry weight (d.w.)

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
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.
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 ammonia/amines type (K-P)
Protective measures	:	See Annex to the Safety data sheet for additional information in the Exposure Scenario(s).

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	:	liquid
Colour	:	off-white
Odour	:	slight, amine-like
Odour Threshold	:	No data is available on the product itself.
pH	:	ca. 13 (20 °C) Concentration: 1,000 g/l
Melting point/freezing point	:	< -20 °C Method: OECD Test Guideline 102
Boiling point	:	274.6 °C (1,013.25 hPa)

Flash point	:	118 °C Method: closed cup
Flammability (solid, gas)	:	No data is available on the product itself.
Upper explosion limit / Upper flammability limit	:	3.6 %(V)
Lower explosion limit / Lower flammability limit	:	1 %(V)
Vapour pressure	:	0.00346 hPa (20 °C) Method: OECD Test Guideline 104
Relative vapour density	:	5.04
Relative density	:	0.971 (25 °C)
Density	:	0.971 g/cm3 (25 °C)
Solubility(ies)		
Water solubility	:	> 1,000 g/l soluble in cold water (20 °C) Method: OECD Test Guideline 105
Solubility in other solvents	:	Solvent: Methanol Description: partly soluble Solvent: Acetone Description: partly soluble
Partition coefficient: n-octanol/water	:	log Pow: -2.65 (20 °C) Method: OECD Test Guideline 117
Auto-ignition temperature	:	325 °C Method: EU Method A.15
Decomposition temperature	:	> 240 °C
Viscosity		
Viscosity, dynamic	:	13.9 mPa.s
Viscosity, kinematic	:	10.3 mm2/s (40 °C)

9.2 Other information

Explosive properties	:	No data is available on the product itself.
Oxidizing properties	:	No data is available on the product itself.
Burning rate	:	No data is available on the product itself.
Evaporation rate	:	No data is available on the product itself.

Molecular weight	:	146.24 g/mol
Metal corrosion rate	:	Not corrosive to metals

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 : Acids
Chlorinated hydrocarbons
Cobalt
Copper
Copper alloys
Nickel
Oxidizing agents

10.6 Hazardous decomposition products

Hazardous decomposition products : ammonia, anhydrous
Aldehydes
Nitrogen oxides (NOx)
carbon monoxide
carbon dioxide
Ketones

SECTION 11: Toxicological information

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

Acute toxicity

Components:

Amines, polyethylenepoly-, triethylenetetramine fraction:

Acute oral toxicity : LD50 (Rat, male and female): 1,716.2 mg/kg
Method: OECD Test Guideline 401
Assessment: The component/mixture is moderately toxic after single ingestion.

Acute dermal toxicity : LD50 (Rabbit, male and female): 1,465.4 mg/kg

Method: OECD Test Guideline 402
Assessment: The component/mixture is moderately toxic after single contact with skin.

Skin corrosion/irritation

Components:

Amines, polyethylenepoly-, triethylenetetramine fraction:

Species	:	reconstructed human epidermis (RhE)
Assessment	:	Causes burns.
Method	:	OECD Test Guideline 435
Result	:	Corrosive after 3 minutes to 1 hour of exposure
Species	:	Rabbit
Assessment	:	Causes burns.
Method	:	OECD Test Guideline 404
Result	:	Corrosive after 3 minutes to 1 hour of exposure

Serious eye damage/eye irritation

Components:

Amines, polyethylenepoly-, triethylenetetramine fraction:

Species	:	Rabbit
Assessment	:	Risk of serious damage to eyes.
Method	:	OECD Test Guideline 405
Result	:	Irreversible effects on the eye

Respiratory or skin sensitisation

Components:

Amines, polyethylenepoly-, triethylenetetramine fraction:

Exposure routes	:	Skin
Species	:	Guinea pig
Assessment	:	Probability or evidence of skin sensitisation in humans
Method	:	OECD Test Guideline 406
Result	:	Probability or evidence of skin sensitisation in humans

Germ cell mutagenicity

Components:

Amines, polyethylenepoly-, triethylenetetramine fraction:

Genotoxicity in vitro : Test Type: reverse mutation assay
Test system: Salmonella tryphimurium and E. coli
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: positive
GLP: yes

Test Type: Micronucleus test
Test system: Human lymphocytes
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 487

Result: negative

Genotoxicity in vivo : Test Type: In vivo micronucleus test
Species: Mouse (male and female)
Cell type: Bone marrow
Application Route: Intraperitoneal injection
Dose: 0 - 600 mg/kg
Method: OECD Test Guideline 474
Result: negative

Carcinogenicity

Components:

Amines, polyethylenepoly-, triethylenetetramine fraction:

Species	:	Mouse, male
Application Route	:	Dermal
NOAEL	:	>= 50 mg/kg bw/day
Method	:	OECD Test Guideline 451
Result	:	negative

Species	:	Mouse, male
Application Route	:	Dermal
Exposure time	:	104 weeks
NOAEL	:	>= 20 mg/kg bw/day
Method	:	OECD Test Guideline 451
Result	:	negative

Reproductive toxicity

Components:

Amines, polyethylenepoly-, triethylenetetramine fraction:

Effects on foetal development : Test Type: Pre-natal
Species: Rat
Application Route: Oral
Dose: 75/325/750 mg/kg bw/day
Duration of Single Treatment: 10 d
General Toxicity Maternal: NOAEL: >= 750 mg/kg body weight
Developmental Toxicity: NOAEL: >= 750 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

Test Type: Pre-natal
Species: Rabbit
Application Route: Dermal
Dose: 5/50/125 mg/kg bw/day
Duration of Single Treatment: 13 d
General Toxicity Maternal: NOAEL: 50 mg/kg body weight
Developmental Toxicity: NOAEL: >= 125 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

Reproductive toxicity - Assessment : The reprotoxic effects of Triethylenetetramine (TETA) are under further evaluation as part of the EU REACH program due in part to the aminoethyl ethanolamine (AEEA) content.

STOT - single exposure

No data available

STOT - repeated exposure

No data available

Repeated dose toxicity

Components:

Amines, polyethylenepoly-, triethylenetetramine fraction:

Species	:	Rat, male and female
NOAEL	:	350 mg/kg
Application Route	:	Oral
Exposure time	:	28 d
Number of exposures	:	7 d
Dose	:	100/350/1000 mg/kg bw/day
Method	:	OECD Test Guideline 407
Target Organs	:	Lungs
Remarks	:	Information given is based on data obtained from similar substances.

Species	:	Dog, male and female
NOAEL	:	125 mg/kg
Application Route	:	Oral
Target Organs	:	Lungs
Remarks	:	Information given is based on data obtained from similar substances.

Species	:	Dog, male and female
NOAEL	:	50 mg/kg
Application Route	:	Oral
Method	:	Subchronic toxicity
Remarks	:	Information given is based on data obtained from similar substances.

Species	:	Rat, male and female
NOAEL	:	50 mg/kg
Application Route	:	Oral
Exposure time	:	26 weeks
Dose	:	50/175/600 mg/kg bw/day
Method	:	OECD Test Guideline 408
Target Organs	:	Lungs
Remarks	:	Information given is based on data obtained from similar substances.

Species	:	Mouse, male and female
NOAEL	:	92 mg/kg, 600 ppm
Application Route	:	Oral
Exposure time	:	120/600/3000 ppm
Method	:	OECD Test Guideline 408
Remarks	:	Information given is based on data obtained from similar substances.

Aspiration toxicity

No data available

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:

Amines, polyethylenepoly-, triethylenetetramine fraction:

Toxicity to fish : LC50 (Poecilia reticulata (guppy)): 570 mg/l
Exposure time: 96 h
Test Type: semi-static test
Test substance: Fresh water
Method: Directive 67/548/EEC, Annex V, C.1.

LC50 (Leuciscus idus (Golden orfe)): 200 - 500 mg/l
Exposure time: 96 h

LC50 (Pimephales promelas (fathead minnow)): 330 mg/l
End point: mortality
Exposure time: 96 h
Test Type: static test
Test substance: Fresh water
Method: EPA OTS 797.1400

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 31.1 mg/l
End point: Immobilization
Exposure time: 48 h
Test Type: static test
Test substance: Fresh water
Method: Directive 67/548/EEC, Annex V, C.2.

Toxicity to algae/aquatic plants	:	ErC50 (Selenastrum capricornutum (green algae)): 20 mg/l Exposure time: 72 h Test Type: semi-static test Test substance: Fresh water Method: OECD Test Guideline 201 EC10 (Selenastrum capricornutum (green algae)): 1.34 mg/l Exposure time: 72 h Test Type: semi-static test Test substance: Fresh water Method: OECD Test Guideline 201
Toxicity to microorganisms	:	NOEC (Bacteria): >= 100 mg/l Exposure time: 28 d Method: OECD Test Guideline 216 EC50 (Bacteria): > 100 mg/l Exposure time: 28 h Method: OECD Test Guideline 216 EC50 (Bacteria): 15.7 mg/l Exposure time: 2 h Test Type: static test Test substance: Fresh water NOEC (Bacteria): 1.3 mg/l Exposure time: 2 h Test Type: static test Test substance: Fresh water
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	EC10: 1.9 mg/l Exposure time: 21 d Species: Daphnia magna (Water flea) Test Type: semi-static test Test substance: Fresh water Method: OECD Test Guideline 202
Toxicity to soil dwelling organisms	:	NOEC: ca. 62.5 mg/kg Exposure time: 56 d Species: Eisenia fetida (earthworms) Method: OECD Test Guideline 222 EC50: > 1,000 mg/kg Exposure time: 56 d Species: Eisenia fetida (earthworms) Method: OECD Test Guideline 222

Ecotoxicology Assessment

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

12.2 Persistence and degradability

Components:

Amines, polyethylenepoly-, triethylenetetramine fraction:

Biodegradability	:	Inoculum: activated sludge Result: Not readily biodegradable. Biodegradation: 0 % Exposure time: 162 d Method: OECD Test Guideline 301D Test substance: Fresh water Test Type: aerobic Inoculum: activated sludge Result: Not inherently biodegradable. Biodegradation: 20 % Related to: Dissolved organic carbon (DOC) Exposure time: 84 d Method: OECD Test Guideline 302A Test substance: Fresh water

12.3 Bioaccumulative potential

Components:

Amines, polyethylenepoly-, triethylenetetramine fraction:

Partition coefficient: n-octanol/water	:	log Pow: -2.08 - 2.90 (20 °C) Method: QSAR

12.4 Mobility in soil

Components:

Amines, polyethylenepoly-, triethylenetetramine fraction:

Distribution among environmental compartments	:	Koc: 3162.28, log Koc: 3.5 Method: OECD Test Guideline 106

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. Harmful 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

ADR	:	UN 2259
RID	:	UN 2259
IMDG	:	UN 2259
IATA	:	UN 2259

14.2 UN proper shipping name

ADR	:	TRIETHYLENETETRAMINE
RID	:	TRIETHYLENETETRAMINE
IMDG	:	TRIETHYLENETETRAMINE
IATA	:	Triethylenetetramine

14.3 Transport hazard class(es)

		Class	Subsidiary risks
ADR	:	8	
RID	:	8	
IMDG	:	8	
IATA	:	8	

14.4 Packing group

ADR

Packing group	:	II
Classification Code	:	C7
Hazard Identification Number	:	80
Labels	:	8
Tunnel restriction code	:	(E)

RID

Packing group	:	II
Classification Code	:	C7

Hazard Identification Number	:	80
Labels	:	8

IMDG

Packing group	:	II
Labels	:	8
EmS Code	:	F-A, S-B

IATA (Cargo)

Packing instruction (cargo aircraft)	:	855
Packing instruction (LQ)	:	Y840
Packing group	:	II
Labels	:	Corrosive

IATA (Passenger)

Packing instruction (passenger aircraft)	:	851
Packing instruction (LQ)	:	Y840
Packing group	:	II
Labels	:	Corrosive

14.5 Environmental hazards

ADR

Environmentally hazardous	:	no

RID

Environmentally hazardous	:	no

IMDG

Marine pollutant	:	no

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

Relevant EU provisions transposed through retained EU law

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 (Regulation (EC) No 1907/2006 (REACH), Article 57).
REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances,	:	Conditions of restriction for the following entries should be

mixtures and articles (Annex XVII)		considered: Number on list 3
UK REACH List of substances subject to authorisation (Annex XIV)	:	Not applicable
Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.		Not applicable

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
NZIoC	:	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

A Chemical Safety Assessment has been carried out for this substance.
For further information see eSDS.

SECTION 16: Other information

Further information

While 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.

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	Formulation;, Ashless Dispersant. Industrial uses
ES 2	Formulation;, Diesel and gasoline additive. Industrial uses
ES 3	Formulation;, Wood preservatives Industrial uses
ES 4	Formulation;, Epoxy curing agent. Industrial uses
ES 5	Formulation;, Epoxy curing agent in paint. Industrial uses
ES 6	Formulation;, Coatings, adhesives, inks. Industrial uses
ES 7	Use at industrial sites:, Ashless Dispersant. Industrial uses
ES 8	Use at industrial sites:, Diesel and gasoline additive. Industrial uses
ES 9	Use at industrial sites:, Wood preservatives Industrial uses
ES 10	Use at industrial sites:, Epoxy curing agent. Industrial uses
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ES 12	Use at industrial sites:, Processing aid Industrial uses
ES 13	Use at industrial sites:, Coatings, adhesives, inks. Industrial uses
ES 14	Use as laboratory chemical. Industrial uses

ES 1: Formulation;, Ashless Dispersant..

1.1. Title section

Exposure Scenario name	:	Formulation;, Ashless Dispersant.

Environment		
CS 1	**Formulation into mixture**	ERC2
Worker		
CS 2	**Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions**	PROC1
CS 3	**Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions**	PROC2
CS 4	**Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition**	PROC3
CS 5	**Chemical production where opportunity for exposure arises**	PROC4
CS 6	**Mixing or blending in batch processes**	PROC5
CS 7	**Transfer of substance or mixture (charging/discharging) at non dedicated-facilities**	PROC8a
CS 8	**Transfer of substance or mixture (charging/discharging) at dedicated facilities**	PROC8b
CS 9	**Transfer of substance or mixture into small containers (dedicated filling line, including weighing)**	PROC9
CS 10	**Use as laboratory reagent**	PROC15

1.2. Conditions of use affecting exposure

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

Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount used in the EU	:	1160 tonnes/year

Daily amount per site	:	3866.666667 kg/day
Fraction of EU tonnage used in region:	:	1
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 3,917.6 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by soil.
Emission days	:	300
Conditions and measures related to sewage treatment plant		
STP type	:	Onsite sewage treatment plant
STP effluent	:	2,000 m3/d
Other conditions affecting environmental exposure		
Receiving surface water flow	:	18,000 m3/d
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 480 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Inhalation - minimum efficiency of 30 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

1.2.4. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		

Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

1.2.7. 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 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week

Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

1.2.8. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 95 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use

Temperature	:	40 °C

1.2.9. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 5%.		
Physical form of product	:	Liquid mixture
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min

Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

1.3. Exposure estimation and reference to its source

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

Release route	Release rate	Release estimation method
Water	0 %	Environmental Release Category (ERC)
Air	0 %	Environmental Release Category (ERC)
Soil	0 %	Environmental Release Category (ERC)

Protection Target	Exposure estimate	RCR
Sewage treatment plant	< 0.0000001mg/L (EU TGD)	< 0.001
Freshwater	0.0000076mg/L (EU TGD)	< 0.001
Freshwater sediment	0.0024263mg/kg dry weight (EU TGD)	< 0.001
Marine water	0.0000008mg/L (EU TGD)	< 0.001
Marine sediment	0.0002466mg/kg dry weight (EU TGD)	< 0.001
Soil	0.0012337mg/kg dry weight (EU TGD)	< 0.001
Secondary poisoning	0.0001753mg/kg bw/day (EU TGD)	< 0.001

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

Exposure route	Health effect	Exposure	Exposure	RCR

		indicator	estimate	
inhalative	systemic	long-term	0.05mg/m³ (EASY TRA v3.6)	0.093

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.43mg/m³ (EASY TRA v3.6)	0.796

1.3.4. 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	0.129mg/m³ (EASY TRA v3.6)	0.239

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.215mg/m³ (EASY TRA v3.6)	0.398

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.215mg/m³ (EASY TRA v3.6)	0.398

1.3.7. 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	0.43mg/m³ (EASY TRA v3.6)	0.796

1.3.8. 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	0.107mg/m³ (EASY TRA v3.6)	0.199

1.3.9. 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	0.215mg/m³ (EASY TRA v3.6)	0.398

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.43mg/m³ (EASY TRA v3.6)	0.796

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;, Diesel and gasoline additive..

2.1. Title section

Exposure Scenario name	:	Formulation;, Diesel and gasoline additive.

Environment		
CS 1	**Formulation into mixture**	ERC2
Worker		
CS 2	**Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition**	PROC3
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	**Transfer of substance or mixture into small containers (dedicated filling line, including weighing)**	PROC9
CS 7	**Use as laboratory reagent**	PROC15

2.2. Conditions of use affecting exposure

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

Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount used in the EU	:	0.5858 tonnes/year
Daily amount per site	:	1.604932 kg/day
Fraction of EU tonnage used in region:	:	1
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 1,653.4 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by soil.
Emission days	:	365

Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP effluent	:	2,000 m3/d
Other conditions affecting environmental exposure		
Receiving surface water flow	:	18,000 m3/d
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

2.2.2. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

2.2.4. 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 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		

Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

2.2.5. 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 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 95 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

2.2.6. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

2.2.7. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week

Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

2.3. Exposure estimation and reference to its source

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

Release route	Release rate	Release estimation method
Water	0 %	Environmental Release Category (ERC)
Air	0.001 %	Environmental Release Category (ERC)
Soil	0 %	Environmental Release Category (ERC)

Protection Target	Exposure estimate	RCR
Sewage treatment plant	< 0.0000001mg/L (EU TGD)	< 0.001
Freshwater	0.0000076mg/L (EU TGD)	< 0.001
Freshwater sediment	0.0024263mg/kg dry weight (EU TGD)	< 0.001
Marine water	0.0000008mg/L (EU TGD)	< 0.001
Marine sediment	0.0002466mg/kg dry weight (EU TGD)	< 0.001
Soil	0.0012134mg/kg dry weight (EU TGD)	< 0.001
Secondary poisoning	0.0001743mg/kg bw/day (EU TGD)	< 0.001

2.3.2. 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	0.129mg/m³ (EASY TRA v3.6)	0.239

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.215mg/m³ (EASY TRA v3.6)	0.398

2.3.4. 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	0.43mg/m³ (EASY TRA v3.6)	0.796

2.3.5. 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	0.107mg/m³ (EASY TRA v3.6)	0.199

2.3.6. 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	0.215mg/m³ (EASY TRA v3.6)	0.398

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.215mg/m³ (EASY TRA v3.6)	0.398

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: Formulation;, Wood preservatives.

3.1. Title section

Exposure Scenario name	:	Formulation;, Wood preservatives

Environment		
CS 1	**Formulation into mixture**	ERC2
Worker		
CS 2	**Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition**	PROC3
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	**Transfer of substance or mixture into small containers (dedicated filling line, including weighing)**	PROC9
CS 7	**Use as laboratory reagent**	PROC15

3.2. Conditions of use affecting exposure

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

Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount used in the EU	:	27.2 tonnes/year
Daily amount per site	:	123.636364 kg/day
Fraction of EU tonnage used in region:	:	1
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 1,096.5 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by soil.
Emission days	:	220

Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP effluent	:	2,000 m3/d
Other conditions affecting environmental exposure		
Receiving surface water flow	:	18,000 m3/d
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

3.2.2. Control of worker exposure: 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

3.2.4. 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 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		

Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

3.2.5. 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 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 95 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

3.2.6. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

3.2.7. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week

Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

3.3. Exposure estimation and reference to its source

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

Release route	Release rate	Release estimation method
Water	0.02 %	Environmental Release Category (ERC)
Air	0 %	Environmental Release Category (ERC)
Soil	0 %	Environmental Release Category (ERC)

Protection Target	Exposure estimate	RCR
Sewage treatment plant	0.008612mg/L (EU TGD)	0.066
Freshwater	0.0008647mg/L (EU TGD)	0.032
Freshwater sediment	0.2765388mg/kg dry weight (EU TGD)	0.032
Marine water	0.0000865mg/L (EU TGD)	0.032
Marine sediment	0.0276579mg/kg dry weight (EU TGD)	0.032
Soil	0.1409497mg/kg dry weight (EU TGD)	0.113
Secondary poisoning	0.0072678mg/kg bw/day (EU TGD)	< 0.001

3.3.2. 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	0.129mg/m³ (EASY TRA v3.6)	0.239

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.215mg/m³ (EASY TRA v3.6)	0.398

3.3.4. 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	0.43mg/m³ (EASY TRA v3.6)	0.796

3.3.5. 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	0.107mg/m³ (EASY TRA v3.6)	0.199

3.3.6. 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	0.215mg/m³ (EASY TRA v3.6)	0.398

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.215mg/m³ (EASY TRA v3.6)	0.398

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: Formulation;, Epoxy curing agent..

4.1. Title section

Exposure Scenario name	:	Formulation;, Epoxy curing agent.

Environment		
CS 1	**Formulation into mixture**	ERC2
Worker		
CS 2	**Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition**	PROC3
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	**Transfer of substance or mixture into small containers (dedicated filling line, including weighing)**	PROC9
CS 7	**Use as laboratory reagent**	PROC15

4.2. Conditions of use affecting exposure

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

Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount used in the EU	:	97.3 tonnes/year
Daily amount per site	:	442.272727 kg/day
Fraction of EU tonnage used in region:	:	1
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 449,304.2 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by soil.
Emission days	:	220

Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP effluent	:	2,000 m3/d
Other conditions affecting environmental exposure		
Receiving surface water flow	:	18,000 m3/d
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

4.2.2. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

4.2.4. 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 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		

Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

4.2.5. 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 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 95 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

4.2.6. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

4.2.7. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week

Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

4.3. Exposure estimation and reference to its source

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

Release route	Release rate	Release estimation method
Water	0 %	Environmental Release Category (ERC)
Air	0.001 %	Environmental Release Category (ERC)
Soil	0 %	Environmental Release Category (ERC)

Protection Target	Exposure estimate	RCR
Sewage treatment plant	< 0.0000001mg/L (EU TGD)	< 0.001
Freshwater	0.0000076mg/L (EU TGD)	< 0.001
Freshwater sediment	0.0024263mg/kg dry weight (EU TGD)	< 0.001
Marine water	0.0000008mg/L (EU TGD)	< 0.001
Marine sediment	0.0002466mg/kg dry weight (EU TGD)	< 0.001
Soil	0.0012304mg/kg dry weight (EU TGD)	< 0.001
Secondary poisoning	0.0001751mg/kg bw/day (EU TGD)	< 0.001

4.3.2. 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	0.129mg/m³ (EASY TRA v3.6)	0.239

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.215mg/m³ (EASY TRA v3.6)	0.398

4.3.4. 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	0.43mg/m³ (EASY TRA v3.6)	0.796

4.3.5. 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	0.107mg/m³ (EASY TRA v3.6)	0.199

4.3.6. 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	0.215mg/m³ (EASY TRA v3.6)	0.398

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.215mg/m³ (EASY TRA v3.6)	0.398

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: Formulation;, Epoxy curing agent in paint..

5.1. Title section

Exposure Scenario name	:	Formulation;, Epoxy curing agent in paint.

Environment		
CS 1	**Formulation into mixture**	ERC2
Worker		
CS 2	**Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition**	PROC3
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	**Transfer of substance or mixture into small containers (dedicated filling line, including weighing)**	PROC9
CS 7	**Use as laboratory reagent**	PROC15

5.2. Conditions of use affecting exposure

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

Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount used in the EU	:	243 tonnes/year
Daily amount per site	:	1000 kg/day
Fraction of EU tonnage used in region:	:	1
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 995,099.8 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by soil.
Emission days	:	243

Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP effluent	:	2,000 m3/d
Other conditions affecting environmental exposure		
Receiving surface water flow	:	18,000 m3/d
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

5.2.2. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

5.2.4. 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 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		

Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

5.2.5. 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 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 95 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

5.2.6. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

5.2.7. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week

Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

5.3. Exposure estimation and reference to its source

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

Release route	Release rate	Release estimation method
Water	0 %	Environmental Release Category (ERC)
Air	0.001 %	Environmental Release Category (ERC)
Soil	0 %	Environmental Release Category (ERC)

Protection Target	Exposure estimate	RCR
Sewage treatment plant	< 0.0000001mg/L (EU TGD)	< 0.001
Freshwater	0.0000076mg/L (EU TGD)	< 0.001
Freshwater sediment	0.0024263mg/kg dry weight (EU TGD)	< 0.001
Marine water	0.0000008mg/L (EU TGD)	< 0.001
Marine sediment	0.0002466mg/kg dry weight (EU TGD)	< 0.001
Soil	0.0012562mg/kg dry weight (EU TGD)	0.001
Secondary poisoning	0.0001765mg/kg bw/day (EU TGD)	< 0.001

5.3.2. 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	0.129mg/m³ (EASY TRA v3.6)	0.239

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.215mg/m³ (EASY TRA v3.6)	0.398

5.3.4. 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	0.43mg/m³ (EASY TRA v3.6)	0.796

5.3.5. 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	0.107mg/m³ (EASY TRA v3.6)	0.199

5.3.6. 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	0.215mg/m³ (EASY TRA v3.6)	0.398

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.215mg/m³ (EASY TRA v3.6)	0.398

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: Formulation;, Coatings, adhesives, inks..

6.1. Title section

Exposure Scenario name	:	Formulation;, Coatings, adhesives, inks.

Environment		
CS 1	**Formulation into mixture**	ERC2
Worker		
CS 2	**Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions**	PROC1
CS 3	**Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions**	PROC2
CS 4	**Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition**	PROC3
CS 5	**Chemical production where opportunity for exposure arises**	PROC4
CS 6	**Mixing or blending in batch processes**	PROC5
CS 7	**Transfer of substance or mixture (charging/discharging) at dedicated facilities**	PROC8b
CS 8	**Transfer of substance or mixture into small containers (dedicated filling line, including weighing)**	PROC9

6.2. Conditions of use affecting exposure

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

Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount used in the EU	:	2560 tonnes/year
Daily amount per site	:	7013.69863 kg/day
Fraction of EU tonnage used in region:	:	1
Maximum allowable site tonnage	:	Daily amount per site

(MSafe)		22,052.1 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by soil.
Emission days	:	365
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP effluent	:	2,000 m3/d
Other conditions affecting environmental exposure		
Receiving surface water flow	:	18,000 m3/d
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 480 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Inhalation - minimum efficiency of 30 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

6.2.4. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		

Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

6.2.7. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		

Local exhaust ventilation Inhalation - minimum efficiency of 95 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

6.2.8. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

6.3. Exposure estimation and reference to its source

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

Release route	Release rate	Release estimation method
Water	0.001 %	Environmental Release Category (ERC)
Air	0 %	Environmental Release Category (ERC)
Soil	0 %	Environmental Release Category (ERC)

Protection Target	Exposure estimate	RCR
Sewage treatment plant	0.0244273mg/L (EU TGD)	0.188
Freshwater	0.0024388mg/L (EU TGD)	0.09
Freshwater sediment	0.7799252mg/kg dry weight (EU TGD)	0.091
Marine water	0.0002439mg/L (EU TGD)	0.09
Marine sediment	0.0779965mg/kg dry weight (EU TGD)	0.091
Soil	0.3975645mg/kg dry weight (EU TGD)	0.318
Secondary poisoning	0.0202946mg/kg bw/day (EU TGD)	< 0.001

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.05mg/m³ (EASY TRA v3.6)	0.093

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.43mg/m³ (EASY TRA v3.6)	0.796

6.3.4. 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	0.129mg/m³ (EASY TRA v3.6)	0.239

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.215mg/m³ (EASY TRA v3.6)	0.398

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.215mg/m³ (EASY TRA v3.6)	0.398

6.3.7. 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	0.107mg/m³ (EASY TRA v3.6)	0.199

6.3.8. 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	0.215mg/m³ (EASY TRA v3.6)	0.398

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: Use at industrial sites:, Ashless Dispersant..

7.1. Title section

Exposure Scenario name	:	Use at industrial sites:, Ashless Dispersant.

Environment		
CS 1	**Use of intermediate**	ERC6a
Worker		
CS 2	**Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions**	PROC1
CS 3	**Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions**	PROC2
CS 4	**Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition**	PROC3
CS 5	**Chemical production where opportunity for exposure arises**	PROC4
CS 6	**Transfer of substance or mixture (charging/discharging) at non dedicated-facilities**	PROC8a
CS 7	**Transfer of substance or mixture (charging/discharging) at dedicated facilities**	PROC8b
CS 8	**Use as laboratory reagent**	PROC15

7.2. Conditions of use affecting exposure

7.2.1. Control of environmental exposure: Use of intermediate (ERC6a)

Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount used in the EU	:	1160 tonnes/year
Daily amount per site	:	3866.666667 kg/day
Fraction of EU tonnage used in region:	:	1
Maximum allowable site tonnage	:	Daily amount per site

(MSafe)		3,408.5 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by soil.
Emission days	:	300
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP effluent	:	2,000 m3/d
Other conditions affecting environmental exposure		
Receiving surface water flow	:	18,000 m3/d
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 480 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Inhalation - minimum efficiency of 30 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

7.2.4. 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 substance
Vapour pressure	:	0.436 Pa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		

Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	20 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

7.2.6. 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 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

7.2.7. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		

Local exhaust ventilation Inhalation - minimum efficiency of 95 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

7.2.8. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

7.3. Exposure estimation and reference to its source

7.3.1. Environmental release and exposure: Use of intermediate (ERC6a)

Release route	Release rate	Release estimation method
Water	0 %	Environmental Release Category (ERC)
Air	0.001 %	Environmental Release Category (ERC)
Soil	0 %	Environmental Release Category (ERC)

Protection Target	Exposure estimate	RCR
Sewage treatment plant	< 0.0000001mg/L (EU TGD)	< 0.001
Freshwater	0.0000076mg/L (EU TGD)	< 0.001
Freshwater sediment	0.0024263mg/kg dry weight (EU TGD)	< 0.001
Marine water	0.0000008mg/L (EU TGD)	< 0.001
Marine sediment	0.0002466mg/kg dry weight (EU TGD)	< 0.001
Soil	0.001418mg/kg dry weight (EU TGD)	0.001
Secondary poisoning	0.0001849mg/kg bw/day (EU TGD)	< 0.001

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.05mg/m³ (EASY TRA v3.6)	0.093

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.43mg/m³ (EASY TRA v3.6)	0.796

7.3.4. 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	0.129mg/m³ (EASY TRA v3.6)	0.239

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.215mg/m³ (EASY TRA v3.6)	0.398

7.3.6. 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	0.43mg/m³ (EASY TRA v3.6)	0.796

7.3.7. 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	0.107mg/m³ (EASY TRA v3.6)	0.199

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.215mg/m³ (EASY TRA v3.6)	0.398

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.

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 8: Use at industrial sites:, Diesel and gasoline additive..

8.1. Title section

Exposure Scenario name	:	Use at industrial sites:, Diesel and gasoline additive.

Environment		
CS 1	**Use of intermediate**	ERC6a
Worker		
CS 2	**Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions**	PROC1
CS 3	**Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions**	PROC2
CS 4	**Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition**	PROC3
CS 5	**Chemical production where opportunity for exposure arises**	PROC4
CS 6	**Transfer of substance or mixture (charging/discharging) at non dedicated-facilities**	PROC8a
CS 7	**Transfer of substance or mixture (charging/discharging) at dedicated facilities**	PROC8b
CS 8	**Use as laboratory reagent**	PROC15

8.2. Conditions of use affecting exposure

8.2.1. Control of environmental exposure: Use of intermediate (ERC6a)

Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount used in the EU	:	0.58 tonnes/year
Daily amount per site	:	1.589041 kg/day
Fraction of EU tonnage used in region:	:	1
Maximum allowable site tonnage	:	Daily amount per site

(MSafe)		1,637 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by soil.
Emission days	:	365
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP effluent	:	2,000 m3/d
Other conditions affecting environmental exposure		
Receiving surface water flow	:	18,000 m3/d
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 480 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Inhalation - minimum efficiency of 30 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

8.2.4. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		

Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

8.2.6. 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 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

8.2.7. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		

Local exhaust ventilation Inhalation - minimum efficiency of 95 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

8.2.8. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

8.3. Exposure estimation and reference to its source

8.3.1. Environmental release and exposure: Use of intermediate (ERC6a)

Release route	Release rate	Release estimation method
Water	0 %	Environmental Release Category (ERC)
Air	0.001 %	Environmental Release Category (ERC)
Soil	0 %	Environmental Release Category (ERC)

Protection Target	Exposure estimate	RCR
Sewage treatment plant	< 0.0000001mg/L (EU TGD)	< 0.001
Freshwater	0.0000076mg/L (EU TGD)	< 0.001
Freshwater sediment	0.0024263mg/kg dry weight (EU TGD)	< 0.001
Marine water	0.0000008mg/L (EU TGD)	< 0.001
Marine sediment	0.0002466mg/kg dry weight (EU TGD)	< 0.001
Soil	0.0012134mg/kg dry weight (EU TGD)	< 0.001
Secondary poisoning	0.0001743mg/kg bw/day (EU TGD)	< 0.001

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.05mg/m³ (EASY TRA v3.6)	0.093

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.43mg/m³ (EASY TRA v3.6)	0.796

8.3.4. 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	0.129mg/m³ (EASY TRA v3.6)	0.239

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.215mg/m³ (EASY TRA v3.6)	0.398

8.3.6. 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	0.43mg/m³ (EASY TRA v3.6)	0.796

8.3.7. 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	0.107mg/m³ (EASY TRA v3.6)	0.199

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.215mg/m³ (EASY TRA v3.6)	0.398

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.

ES 9: Use at industrial sites:, Wood preservatives.

9.1. Title section

Exposure Scenario name	:	Use at industrial sites:, Wood preservatives

Environment		
CS 1	**Use of intermediate**	ERC6a
Worker		
CS 2	**Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions**	PROC1
CS 3	**Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions**	PROC2
CS 4	**Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition**	PROC3
CS 5	**Chemical production where opportunity for exposure arises**	PROC4
CS 6	**Transfer of substance or mixture (charging/discharging) at non dedicated-facilities**	PROC8a
CS 7	**Transfer of substance or mixture (charging/discharging) at dedicated facilities**	PROC8b
CS 8	**Use as laboratory reagent**	PROC15

9.2. Conditions of use affecting exposure

9.2.1. Control of environmental exposure: Use of intermediate (ERC6a)

Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount used in the EU	:	27.2 tonnes/year
Daily amount per site	:	123.636364 kg/day
Fraction of EU tonnage used in region:	:	1
Maximum allowable site tonnage	:	Daily amount per site

(MSafe)		1,096.5 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by soil.
Emission days	:	220
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP effluent	:	2,000 m3/d
Other conditions affecting environmental exposure		
Receiving surface water flow	:	18,000 m3/d
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 480 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Inhalation - minimum efficiency of 30 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

9.2.4. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		

Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

9.2.6. 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 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

9.2.7. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		

Local exhaust ventilation Inhalation - minimum efficiency of 95 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

9.2.8. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

9.3. Exposure estimation and reference to its source

9.3.1. Environmental release and exposure: Use of intermediate (ERC6a)

Release route	Release rate	Release estimation method
Water	0.02 %	Environmental Release Category (ERC)
Air	0 %	Environmental Release Category (ERC)
Soil	0 %	Environmental Release Category (ERC)

Protection Target	Exposure estimate	RCR
Sewage treatment plant	0.008612mg/L (EU TGD)	0.066
Freshwater	0.0008647mg/L (EU TGD)	0.032
Freshwater sediment	0.2765388mg/kg dry weight (EU TGD)	0.032
Marine water	0.0000865mg/L (EU TGD)	0.032
Marine sediment	0.0276579mg/kg dry weight (EU TGD)	0.032
Soil	0.1409497mg/kg dry weight (EU TGD)	0.113
Secondary poisoning	0.0072678mg/kg bw/day (EU TGD)	< 0.001

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.05mg/m³ (EASY TRA v3.6)	0.093

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.43mg/m³ (EASY TRA v3.6)	0.796

9.3.4. 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	0.129mg/m³ (EASY TRA v3.6)	0.239

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.215mg/m³ (EASY TRA v3.6)	0.398

9.3.6. 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	0.43mg/m³ (EASY TRA v3.6)	0.796

9.3.7. 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	0.107mg/m³ (EASY TRA v3.6)	0.199

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.215mg/m³ (EASY TRA v3.6)	0.398

9.4. 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 10: Use at industrial sites:, Epoxy curing agent..

10.1. Title section

Exposure Scenario name	:	Use at industrial sites:, Epoxy curing agent.

Environment		
CS 1	**Use of intermediate**	ERC6a
Worker		
CS 2	**Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions**	PROC1
CS 3	**Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions**	PROC2
CS 4	**Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition**	PROC3
CS 5	**Chemical production where opportunity for exposure arises**	PROC4
CS 6	**Transfer of substance or mixture (charging/discharging) at non dedicated-facilities**	PROC8a
CS 7	**Transfer of substance or mixture (charging/discharging) at dedicated facilities**	PROC8b
CS 8	**Use as laboratory reagent**	PROC15

10.2. Conditions of use affecting exposure

10.2.1. Control of environmental exposure: Use of intermediate (ERC6a)

Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount used in the EU	:	97.3 tonnes/year
Daily amount per site	:	266.575342 kg/day
Fraction of EU tonnage used in region:	:	1
Maximum allowable site tonnage	:	Daily amount per site

(MSafe)		270,813.5 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by soil.
Emission days	:	365
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP effluent	:	2,000 m3/d
Other conditions affecting environmental exposure		
Receiving surface water flow	:	18,000 m3/d
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Inhalation - minimum efficiency of 30 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

10.2.4. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		

Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

10.2.6. 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 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

10.2.7. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		

Local exhaust ventilation Inhalation - minimum efficiency of 95 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

10.2.8. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

10.3. Exposure estimation and reference to its source

10.3.1. Environmental release and exposure: Use of intermediate (ERC6a)

Release route	Release rate	Release estimation method
Water	0 %	Environmental Release Category (ERC)
Air	0.001 %	Environmental Release Category (ERC)
Soil	0 %	Environmental Release Category (ERC)

Protection Target	Exposure estimate	RCR
Sewage treatment plant	< 0.0000001mg/L (EU TGD)	< 0.001
Freshwater	0.0000076mg/L (EU TGD)	< 0.001
Freshwater sediment	0.0024263mg/kg dry weight (EU TGD)	< 0.001
Marine water	0.0000008mg/L (EU TGD)	< 0.001
Marine sediment	0.0002466mg/kg dry weight (EU TGD)	< 0.001
Soil	0.0012304mg/kg dry weight (EU TGD)	< 0.001
Secondary poisoning	0.0001751mg/kg bw/day (EU TGD)	< 0.001

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.03mg/m³ (EASY TRA v3.6)	0.056

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.43mg/m³ (EASY TRA v3.6)	0.796

10.3.4. 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	0.129mg/m³ (EASY TRA v3.6)	0.239

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.215mg/m³ (EASY TRA v3.6)	0.398

10.3.6. 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	0.43mg/m³ (EASY TRA v3.6)	0.796

10.3.7. 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	0.107mg/m³ (EASY TRA v3.6)	0.199

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.215mg/m³ (EASY TRA v3.6)	0.398

10.4. 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 11: Use at industrial sites:, Epoxy curing agent in paint..

11.1. Title section

Exposure Scenario name	:	Use at industrial sites:, Epoxy curing agent in paint.

Environment		
CS 1	**Use of intermediate**	ERC6a
Worker		
CS 2	**Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions**	PROC1
CS 3	**Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions**	PROC2
CS 4	**Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition**	PROC3
CS 5	**Chemical production where opportunity for exposure arises**	PROC4
CS 6	**Transfer of substance or mixture (charging/discharging) at non dedicated-facilities**	PROC8a
CS 7	**Transfer of substance or mixture (charging/discharging) at dedicated facilities**	PROC8b
CS 8	**Use as laboratory reagent**	PROC15

11.2. Conditions of use affecting exposure

11.2.1. Control of environmental exposure: Use of intermediate (ERC6a)

Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount used in the EU	:	0.243 tonnes/year
Daily amount per site	:	0.665753 kg/day
Fraction of EU tonnage used in region:	:	1
Maximum allowable site tonnage	:	Daily amount per site

(MSafe)		685.9 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by soil.
Emission days	:	365
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP effluent	:	2,000 m3/d
Other conditions affecting environmental exposure		
Receiving surface water flow	:	18,000 m3/d
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 480 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Inhalation - minimum efficiency of 30 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

11.2.4. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		

Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

11.2.6. 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 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

11.2.7. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		

Local exhaust ventilation Inhalation - minimum efficiency of 95 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

11.2.8. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

11.3. Exposure estimation and reference to its source

11.3.1. Environmental release and exposure: Use of intermediate (ERC6a)

Release route	Release rate	Release estimation method
Water	0 %	Environmental Release Category (ERC)
Air	0.001 %	Environmental Release Category (ERC)
Soil	0 %	Environmental Release Category (ERC)

Protection Target	Exposure estimate	RCR
Sewage treatment plant	< 0.0000001mg/L (EU TGD)	< 0.001
Freshwater	0.0000076mg/L (EU TGD)	< 0.001
Freshwater sediment	0.0024263mg/kg dry weight (EU TGD)	< 0.001
Marine water	0.0000008mg/L (EU TGD)	< 0.001
Marine sediment	0.0002466mg/kg dry weight (EU TGD)	< 0.001
Soil	0.0012133mg/kg dry weight (EU TGD)	< 0.001
Secondary poisoning	0.0001743mg/kg bw/day (EU TGD)	< 0.001

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.05mg/m³ (EASY TRA v3.6)	0.093

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.43mg/m³ (EASY TRA v3.6)	0.796

11.3.4. 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	0.129mg/m³ (EASY TRA v3.6)	0.239

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.215mg/m³ (EASY TRA v3.6)	0.398

11.3.6. 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	0.43mg/m³ (EASY TRA v3.6)	0.796

11.3.7. 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	0.107mg/m³ (EASY TRA v3.6)	0.199

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.215mg/m³ (EASY TRA v3.6)	0.398

11.4. 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 12: Use at industrial sites:, Processing aid.

12.1. Title section

Exposure Scenario name	:	Use at industrial sites:, Processing aid

Environment		
CS 1	**Use of non-reactive processing aid at industrial site (no inclusion into or onto article)**	ERC4
Worker		
CS 2	**Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions**	PROC1
CS 3	**Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions**	PROC2
CS 4	**Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition**	PROC3
CS 5	**Chemical production where opportunity for exposure arises**	PROC4
CS 6	**Mixing or blending in batch processes**	PROC5
CS 7	**Transfer of substance or mixture (charging/discharging) at non dedicated-facilities**	PROC8a
CS 8	**Transfer of substance or mixture (charging/discharging) at dedicated facilities**	PROC8b
CS 9	**Transfer of substance or mixture into small containers (dedicated filling line, including weighing)**	PROC9
CS 10	**Use of blowing agents in manufacture of foam**	PROC12
CS 11	**Treatment of articles by dipping and pouring**	PROC13
CS 12	**Tabletting, compression, extrusion, pelettisation, granulation**	PROC14
CS 13	**Use as laboratory reagent**	PROC15

12.2. Conditions of use affecting exposure

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

Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount used in the EU	:	100 tonnes/year
Daily amount per site	:	273.972603 kg/day
Fraction of EU tonnage used in region:	:	1
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 278,220.6 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by soil.
Emission days	:	365
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP effluent	:	2,000 m3/d
Other conditions affecting environmental exposure		
Receiving surface water flow	:	18,000 m3/d
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 480 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		

Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Inhalation - minimum efficiency of 30 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

12.2.4. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		

Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

12.2.7. 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 100 %.

Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

12.2.8. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 95 %		
Conditions and measures related to personal protection, hygiene and health evaluation		

Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

12.2.9. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

12.2.10. Control of worker exposure: Use of blowing agents in manufacture of foam (PROC12)

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

Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection.		

Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

12.2.12. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

12.2.13. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

12.3. Exposure estimation and reference to its source

12.3.1. 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	0 %	Environmental Release Category (ERC)
Air	0.001 %	Environmental Release Category (ERC)
Soil	0 %	Environmental Release Category (ERC)

Protection Target	Exposure estimate	RCR
Sewage treatment plant	< 0.0000001mg/L (EU TGD)	< 0.001
Freshwater	0.0000076mg/L (EU TGD)	< 0.001
Freshwater sediment	0.0024263mg/kg dry weight (EU TGD)	< 0.001

Marine water	0.0000008mg/L (EU TGD)	< 0.001
Marine sediment	0.0002466mg/kg dry weight (EU TGD)	< 0.001
Soil	0.0012309mg/kg dry weight (EU TGD)	< 0.001
Secondary poisoning	0.0001752mg/kg bw/day (EU TGD)	< 0.001

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.05mg/m³ (EASY TRA v3.6)	0.093

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.43mg/m³ (EASY TRA v3.6)	0.796

12.3.4. 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	0.129mg/m³ (EASY TRA v3.6)	0.239

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.215mg/m³ (EASY TRA v3.6)	0.398

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.215mg/m³ (EASY TRA v3.6)	0.398

12.3.7. 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	0.43mg/m³ (EASY TRA v3.6)	0.796

12.3.8. 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	0.107mg/m³ (EASY TRA v3.6)	0.199

12.3.9. 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	0.215mg/m³ (EASY TRA v3.6)	0.398

12.3.10. Worker exposure: Use of blowing agents in manufacture of foam (PROC12)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.086mg/m³ (EASY TRA v3.6)	0.159

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.43mg/m³ (EASY TRA v3.6)	0.796

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.215mg/m³ (EASY TRA v3.6)	0.398

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.215mg/m³ (EASY TRA v3.6)	0.398

12.4. 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 13: Use at industrial sites:, Coatings, adhesives, inks..

13.1. Title section

Exposure Scenario name	:	Use at industrial sites:, Coatings, adhesives, inks.

Environment		
CS 1	**Use of non-reactive processing aid at industrial site (no inclusion into or onto article)**	ERC4
Worker		
CS 2	**Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions**	PROC2
CS 3	**Mixing or blending in batch processes**	PROC5
CS 4	**Industrial spraying**	PROC7
CS 5	**Transfer of substance or mixture (charging/discharging) at dedicated facilities**	PROC8b
CS 6	**Roller application or brushing**	PROC10
CS 7	**Treatment of articles by dipping and pouring**	PROC13

13.2. Conditions of use affecting exposure

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

Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount used in the EU	:	2560 tonnes/year
Daily amount per site	:	7013.69863 kg/day
Fraction of EU tonnage used in region:	:	1
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 1,647.6 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by soil.
Emission days	:	365

Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP effluent	:	2,000 m3/d
Other conditions affecting environmental exposure		
Receiving surface water flow	:	18,000 m3/d
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

13.2.2. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 25 %.		
Physical form of product	:	Liquid mixture

Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Physical form of product	:	Liquid mixture
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Inhalation - minimum efficiency of 30 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 99.9 %		

Other conditions affecting workers exposure		
Body parts exposed	:	Both hands and upper wrists (1500 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

13.2.5. 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 mixture
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 95 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

13.2.6. 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 mixture

Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

13.2.7. 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 mixture
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		

Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

13.3. Exposure estimation and reference to its source

13.3.1. 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	0 %	Environmental Release Category (ERC)
Air	0.01 %	Environmental Release Category (ERC)
Soil	0.005 %	Environmental Release Category (ERC)

Protection Target	Exposure estimate	RCR
Sewage treatment plant	< 0.0000001mg/L (EU TGD)	< 0.001
Freshwater	0.0000076mg/L (EU TGD)	< 0.001
Freshwater sediment	0.0024263mg/kg dry weight (EU TGD)	< 0.001
Marine water	0.0000008mg/L (EU TGD)	< 0.001
Marine sediment	0.0002466mg/kg dry weight (EU TGD)	< 0.001
Soil	0.0053212mg/kg dry weight (EU TGD)	0.004
Secondary poisoning	0.0003873mg/kg bw/day (EU TGD)	< 0.001

13.3.2. 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	0.43mg/m³ (EASY TRA v3.6)	0.796

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.129mg/m³ (EASY TRA v3.6)	0.239

13.3.4. Worker exposure: Industrial spraying (PROC7)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.063mg/m³ (EASY TRA v3.6)	0.116

13.3.5. 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	0.064mg/m³ (EASY TRA v3.6)	0.119

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.258mg/m³ (EASY TRA v3.6)	0.478

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.258mg/m³ (EASY TRA v3.6)	0.478

13.4. 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 14: Use as laboratory chemical..

14.1. Title section

Exposure Scenario name	:	Use as laboratory chemical.

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

14.2. Conditions of use affecting exposure

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

Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount used in the EU	:	1 tonnes/year
Daily amount per site	:	2.739726 kg/day
Fraction of EU tonnage used in region:	:	1
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 2,819 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by soil.
Emission days	:	365
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP effluent	:	2,000 m3/d
Other conditions affecting environmental exposure		
Receiving surface water flow	:	18,000 m3/d
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

14.2.2. 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 substance
Vapour pressure	:	499 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

14.3. Exposure estimation and reference to its source

14.3.1. 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	0 %	Environmental Release Category (ERC)
Air	0.01 %	Environmental Release Category (ERC)
Soil	0 %	Environmental Release Category (ERC)

Protection Target	Exposure estimate	RCR
Sewage treatment plant	< 0.0000001mg/L (EU TGD)	< 0.001

Freshwater	0.0000076mg/L (EU TGD)	< 0.001
Freshwater sediment	0.0024263mg/kg dry weight (EU TGD)	< 0.001
Marine water	0.0000008mg/L (EU TGD)	< 0.001
Marine sediment	0.0002466mg/kg dry weight (EU TGD)	< 0.001
Soil	0.0012149mg/kg dry weight (EU TGD)	< 0.001
Secondary poisoning	0.0001743mg/kg bw/day (EU TGD)	< 0.001

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.215mg/m³ (EASY TRA v3.6)	0.398

14.4. 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.