Ethanol 85%

Version 2.0	Revision Date:	SDS Number:	Date of last issue: 19.07.2022
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SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Trade name	:	Ethanol 85%
Substance name	:	ethanol
Molecular formula	:	C2-H6-O
CAS-No.	:	64-17-5
EC-No.	:	200-578-6
REACH Registration Number	:	01-2119457610-43-0763
Index-No.	:	603-002-00-5

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

Use of the Substance/Mixture	:	Solvent, Anti-freezing agents, Heat transfer agents, Intermediate, Laboratory chemicals

1.3 Details of the supplier of the safety data sheet

Company	:	Jungbunzlauer S.A. Z.I. Portuaire BP 32 67390 Marckolsheim France www.jungbunzlauer.com
Telephone	:	+33 388 582-929
Telefax	:	+33 388 582-941
Responsible/issuing person	:	msds@jungbunzlauer.com

1.4 Emergency telephone number

National Chemical Emergency Centre (NCEC)
+44 1865 407 333

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Flammable liquids, Category 2	H225: Highly flammable liquid and vapour.
Eye irritation, Category 2	H319: Causes serious eye irritation.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms :

Signal word : Danger

Hazard statements : H225 Highly flammable liquid and vapour.
H319 Causes serious eye irritation.

Precautionary statements : **Prevention:**

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233 Keep container tightly closed.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

2.3 Other hazards

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

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

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

SECTION 3: Composition/information on ingredients

3.1 Substances

Substance name : ethanol

CAS-No. : 64-17-5

Index-No. : 603-002-00-5

EC-No. : 200-578-6

SECTION 4: First aid measures

4.1 Description of first aid measures

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

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

Remove person to fresh air. If signs/symptoms continue, get medical attention.
Keep patient warm and at rest.
If symptoms persist, call a physician.

In case of skin contact : If on skin, rinse well with water.
If on clothes, remove clothes.

Call a physician if irritation develops or persists.

In case of eye contact : Immediately flush eye(s) with plenty of water.
Remove contact lenses.
Protect unharmed eye.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.

Flush eyes with water at least 15 minutes. Get medical attention if eye irritation develops or persists.

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

Do NOT induce vomiting.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms : Eye irritation
Skin irritation
Headache
Lack of coordination
Nausea

Risks : Causes serious eye irritation.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment : Treat symptomatically.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media	:	Alcohol-resistant foam Carbon dioxide (CO2) Dry chemical Water spray jet
Unsuitable extinguishing media	:	High volume water jet

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. Vapours may form flammable mixture with air
Hazardous combustion products	:	Carbon monoxide, carbon dioxide and unburned hydrocarbons (smoke). Nitrogen oxides (NOx)

5.3 Advice for firefighters

Special protective equipment for firefighters	:	Wear self-contained breathing apparatus for firefighting if necessary.
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. For safety reasons in case of fire, cans should be stored separately in closed containments. Use a water spray to cool fully closed containers.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions	:	Use personal protective equipment. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

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 : Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

Non-sparking tools should be used.
For large spills, provide dyking or other appropriate containment to keep material from spreading. If dyked material can be pumped, store recovered material in appropriate container.

6.4 Reference to other sections

See sections: 7, 8, 11, 12 and 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling : Avoid formation of aerosol.
Do not breathe vapours/dust.
Avoid contact with skin and eyes.
For personal protection see section 8.
Smoking, eating and drinking should be prohibited in the application area.
Take precautionary measures against static discharges.
Provide sufficient air exchange and/or exhaust in work rooms.
Container may be opened only under exhaust ventilation hood.
Open drum carefully as content may be under pressure.
Dispose of rinse water in accordance with local and national regulations.

Store away from heat.
Avoid spark promoters. Ground/bond container and equipment. These alone may be insufficient to remove static electricity.

Advice on protection against fire and explosion : Do not spray on a naked flame or any incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours). Use only explosion-proof equipment. Keep away from open flames, hot surfaces and sources of ignition.

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 : No smoking. Keep container tightly closed in a dry and well-

areas and containers		ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.
Further information on storage stability	:	No decomposition if stored and applied as directed.
Packaging material	:	Suitable material: Stainless steel, Carbon steel, Polypropylene, glass, Titanium, Neoprene, Carbon Unsuitable material: Zinc, PVC, Polyamide, Brass For further information see eSDS.

7.3 Specific end use(s)

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

Components	CAS-No.	Value type (Form of exposure)	Control parameters	Basis
ethanol	64-17-5	VME	1.000 ppm 1.900 mg/m3	FR VLE
	Further information: Indicative exposure limits			
		VLCT (VLE)	5.000 ppm 9.500 mg/m3	FR VLE
	Further information: Indicative exposure limits			

8.2 Exposure controls

Personal protective equipment

Eye protection	:	Eye wash bottle with pure water Tightly fitting safety goggles Wear face-shield and protective suit for abnormal processing problems.
Hand protection		
Remarks	:	The suitability for a specific workplace should be discussed with the producers of the protective gloves.
Material	:	Nitrile rubber
Break through time	:	> 480 min
Directive	:	Equipment should conform to EN 374
Material	:	butyl-rubber
Break through time	:	> 480 min
Directive	:	Equipment should conform to EN 374 Choose gloves to protect hands against chemicals depending on the concentration and quantity of the hazardous substance and specific to place of work.

Skin and body protection	:	Impervious clothing Choose body protection according to the amount and concentration of the dangerous substance at the work place. Safety shoes
Respiratory protection	:	No personal respiratory protective equipment normally required. General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection. Use the indicated respiratory protection if the occupational exposure limit is exceeded and/or in case of product release (dust).
Filter type	:	Organic gas and low boiling vapour type (AX)

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	:	liquid
Colour	:	colourless
Odour	:	characteristic alcohol-like
Melting point/freezing point	:	not determined
Boiling point/boiling range	:	78,85 °C
Upper explosion limit / Upper flammability limit	:	22,7 %(V)
Lower explosion limit / Lower flammability limit	:	3,9 %(V)
Flash point	:	16,1 °C Method: closed cup

Auto-ignition temperature	:	400,9 °C
pH	:	7
Viscosity		
Viscosity, dynamic	:	1,2 mPa.s
Solubility(ies)		
Water solubility	:	789.000 mg/l (20 °C) completely soluble
Partition coefficient: n-octanol/water	:	log Pow: -0,35 (20 °C)
Vapour pressure	:	5,1 kPa (20 °C)
Relative density	:	0,818 (25 °C)
Density	:	816,53 kg/m3 (25 °C)

9.2 Other information

Surface tension	:	56,4 mN/m, 5, similar to water
Molecular weight	:	46,07 g/mol

SECTION 10: Stability and reactivity

10.1 Reactivity

No decomposition if stored and applied as directed.

10.2 Chemical stability

No decomposition if stored and applied as directed.

10.3 Possibility of hazardous reactions

Hazardous reactions	:	No decomposition if stored and applied as directed. Vapours may form explosive mixture with air.

10.4 Conditions to avoid

Conditions to avoid	:	Heat, flames and sparks.

10.5 Incompatible materials

Materials to avoid	:	Oxidizing agents

10.6 Hazardous decomposition products

SECTION 11: Toxicological information

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

Acute toxicity

Not classified based on available information.

Components:

ethanol:

Acute oral toxicity	:	LD50 (Rat, male and female): 10.470 mg/kg Method: OECD Test Guideline 401 Assessment: The substance or mixture has no acute oral toxicity
Acute inhalation toxicity	:	LC50 (Rat): 50 mg/l Exposure time: 4 h Test atmosphere: vapour Method: OECD Test Guideline 403 Assessment: The substance or mixture has no acute inhalation toxicity
Acute dermal toxicity	:	LD50: 15.800 mg/kg Assessment: The substance or mixture has no acute dermal toxicity

Skin corrosion/irritation

Not classified based on available information.

Product:

Remarks	:	May cause skin irritation in susceptible persons.

Components:

ethanol:

Species	:	Rabbit
Assessment	:	No skin irritation
Method	:	OECD Test Guideline 404
Result	:	No skin irritation

Serious eye damage/eye irritation

Causes serious eye irritation.

Product:

Remarks	:	May cause irreversible eye damage.

Components:

ethanol:

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

Respiratory or skin sensitisation

Skin sensitisation

Not classified based on available information.

Respiratory sensitisation

Not classified based on available information.

Components:

ethanol:

Assessment	:	Contains no substance or substances classified as sensitising.

Germ cell mutagenicity

Not classified based on available information.

Components:

ethanol:

Genotoxicity in vitro	:	Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 471 Result: negative
Germ cell mutagenicity- Assessment	:	Weight of evidence does not support classification as a germ cell mutagen.

Carcinogenicity

Not classified based on available information.

Components:

ethanol:

Carcinogenicity - Assessment	:	Carcinogenicity classification not possible from current data.

Reproductive toxicity

Not classified based on available information.

Components:

ethanol:

Effects on fertility	:	Application Route: Oral Fertility: NOAEL Mating/Fertility: 13.800 mg/kg body weight Result: Not classified Application Route: inhalation (vapour) Fertility: NOAEC Mating/Fertility: 30,4 mg/l Result: Not classified

Application Route: Oral
Early Embryonic Development: NOAEL Mating/Fertility: 5.200 mg/kg body weight
Result: Not classified

Application Route: inhalation (vapour)
Early Embryonic Development: NOAEC Mating/Fertility: 39 mg/l
Result: Not classified

Reproductive toxicity - Assessment : Weight of evidence does not support classification for reproductive toxicity

STOT - single exposure

Not classified based on available information.

Components:

ethanol:

Assessment : The substance or mixture is not classified as specific target organ toxicant, single exposure.

STOT - repeated exposure

Not classified based on available information.

Components:

ethanol:

Assessment : The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Repeated dose toxicity

Components:

ethanol:

Species	:	Rat, male and female
NOAEL	:	1730 mg/kg
Application Route	:	Oral
Exposure time	:	14 w
Method	:	OECD Test Guideline 408
Assessment	:	No adverse effects

Aspiration toxicity

Not classified based on available information.

Components:

ethanol:

Not classified due to data which are conclusive although insufficient for classification.

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

Product:

Inhalation : Symptoms: Drowsiness, Vapour during processing may be irritating to the respiratory tract and to the eyes., Headache, Nausea

Ingestion : Symptoms: Vomiting, Nausea

Further information

Product:

Remarks : Solvents may degrease the skin.

SECTION 12: Ecological information

12.1 Toxicity

Components:

ethanol:

Toxicity to fish : LC50 : 11.200 mg/l
Exposure time: 96 h
No toxicity at the limit of solubility

NOEC : > 79 mg/l
Exposure time: 104 d
No toxicity at the limit of solubility

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 5.012 mg/l
Exposure time: 24 h
No toxicity at the limit of solubility

Toxicity to algae/aquatic plants : EC50 (Chlorella vulgaris (Fresh water algae)): 275 mg/l
Exposure time: 7 d
No toxicity at the limit of solubility

NOEC (Chlorella vulgaris (Fresh water algae)): 11,5 mg/l
Exposure time: 7 d

No toxicity at the limit of solubility

EC50 : 1.900 mg/l
Exposure time: 96 h
No toxicity at the limit of solubility

12.2 Persistence and degradability

Components:

ethanol:

Stability in water : Hydrolyses readily.

12.3 Bioaccumulative potential

Components:

ethanol:

Partition coefficient: n-octanol/water : log Pow: -0,35 (20 °C)

12.4 Mobility in soil

Components:

ethanol:

Stability in soil : Readily biodegradable.

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.

Components:

ethanol:

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

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.

Components:

ethanol:

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

12.7 Other adverse effects

Product:

Additional ecological information : No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product : Do not dispose of waste into sewer.
Do not contaminate ponds, waterways or ditches with chemical or used container.
Send to a licensed waste management company.

Contaminated packaging : Empty remaining contents.
Dispose of as unused product.
Do not re-use empty containers.
Do not burn, or use a cutting torch on, the empty drum.

Dispose of in accordance with local regulations.

SECTION 14: Transport information

14.1 UN number or ID number

ADR : UN 1170

RID : UN 1170

IMDG : UN 1170

IATA : UN 1170

14.2 UN proper shipping name

ADR : ETHANOL SOLUTION
(ethanol solution)

RID : ETHANOL SOLUTION
(ethanol solution)

IMDG : ETHANOL SOLUTION

(ethanol solution)

IATA : Ethanol solution
(ethanol solution)

14.3 Transport hazard class(es)

ADR : 3

RID : 3

IMDG : 3

IATA : 3

14.4 Packing group

ADR

Packing group	:	II
Classification Code	:	F1
Hazard Identification Number	:	33
Labels	:	3
Tunnel restriction code	:	(D/E)

RID

Packing group	:	II
Classification Code	:	F1
Hazard Identification Number	:	33
Labels	:	3

IMDG

Packing group	:	II
Labels	:	3
EmS Code	:	F-E, S-D

IATA (Cargo)

Packing instruction (cargo aircraft)	:	364
Packing instruction (LQ)	:	Y341
Packing group	:	II
Labels	:	Class 3 - Flammable liquids

IATA (Passenger)

Packing instruction (passenger aircraft)	:	353
Packing instruction (LQ)	:	Y341
Packing group	:	II
Labels	:	Class 3 - Flammable liquids

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

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII)	:	Conditions of restriction for the following entries should be considered: Number on list 3
REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59).	:	Not applicable
Regulation (EC) No 1005/2009 on substances that deplete the ozone layer	:	Not applicable
Regulation (EU) 2019/1021 on persistent organic pollutants (recast)	:	Not applicable
Regulation (EC) No 649/2012 of the European Parliament and the Council concerning the export and import of dangerous chemicals	:	Not applicable
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.	P5c	FLAMMABLE LIQUIDS

Occupational Illnesses (R-461-3, France)	:	84
Reinforced medical supervision (R4624-18)	:	The product has no CMR properties
Installations classified for the protection of the environment (Environment Code R511-9)	:	4331
Volatile organic compounds	:	Directive 2010/75/EU of 24 November 2010 on industrial emissions (integrated pollution prevention and control)

Volatile organic compounds (VOC) content: 95 %

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:

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

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

SECTION 16: Other information

Full text of other abbreviations

FR VLE	:	France. Occupational Exposure Limits (INRS)
FR VLE / VME	:	Time Weighted Average
FR VLE / VLCT (VLE)	:	Short Term Exposure Limit

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and

Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - Substance of Very High Concern; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

Further information

Classification of the mixture:		**Classification procedure:**
Flam. Liq. 2	H225	Based on product data or assessment
Eye Irrit. 2	H319	Calculation method

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

Annex

Exposure Scenario

Number	Title
ES1	Manufacture; Manufacture of bulk, large scale chemicals (including petroleum products) (SU8).
ES2	Use at industrial sites; Intermediate (PC19); Various sectors (SU8, SU9).
ES3	Use at industrial sites; Various products (PC0, PC40); Various sectors (SU8, SU9).
ES4	Formulation or re-packing
ES5	Formulation or re-packing; Various products (PC1, PC3, PC4, PC8, PC9a, PC9b, PC9c, PC13, PC14, PC15, PC16, PC18, PC23, PC24, PC27, PC30, PC31, PC34, PC35, PC39).
ES6	Use at industrial sites; Various products (PC1, PC4, PC9a, PC9b, PC13, PC14, PC15, PC18, PC23, PC24, PC30, PC31, PC34, PC35); Various sectors (SU5, SU15, SU16, SU17, SU18).
ES7	Widespread use by professional workers; Various products (PC1, PC4, PC8, PC9a, PC9b, PC9c, PC13, PC18, PC23, PC24, PC27, PC31, PC34, PC35); Various sectors (SU0, SU15, SU16, SU17).
ES8	Use at industrial sites; Heat transfer fluids (PC16).
ES9	Widespread use by professional workers; Heat transfer fluids (PC16); Building and construction work (SU19).
ES10	Widespread use by professional workers; Various products (PC16, PC21); Scientific research and development (SU24).
ES11	Consumer use; Various products (PC1, PC3, PC8, PC18, PC23, PC24, PC27, PC31, PC34).
ES12	Consumer use; Heat transfer fluids (PC16).
ES13	Consumer use; Various products (PC9a, PC9b, PC9c).
ES14	Consumer use; Anti-freeze and de-icing products (PC4).
ES15	Consumer use; Washing and cleaning products (PC35).
ES16	Consumer use; Various products (PC28, PC39).

ES1: Manufacture; Manufacture of bulk, large scale chemicals (including petroleum products) (SU8).

1.1. Title section

Exposure Scenario name	:	Manufacture
Structured Short Title	:	Manufacture; Manufacture of bulk, large scale chemicals (including petroleum products) (SU8).

Environment		
CS1	**Manufacture of the substance**	ERC1
Worker		
CS2	**General measures applicable to all activities**	PROC0
CS3	**Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions**	PROC1
CS4	**Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions**	PROC2
CS5	**Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition**	PROC3
CS6	**Transfer of substance or mixture (charging/discharging) at dedicated facilities**	PROC8b
CS7	**Use as laboratory reagent**	PROC15
CS8	**Manual maintenance (cleaning and repair) of machinery**	PROC28

1.2. Conditions of use affecting exposure

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

Product (article) characteristics		
Physical form of product	:	Liquid
Vapour pressure	:	<= 10 kPa
Amount used, frequency and duration of use (or from service life)		
Annual amount per site	:	200000000 kg

Maximum allowable site tonnage (MSafe)	:	60.700 tonnes/day
Release type	:	Continuous release
Emission days	:	350

Technical and organisational conditions and measures
Bund storage facilities to prevent soil and water pollution in the event of spillage. Prevent environmental discharge consistent with regulatory requirements. Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases. Do not flush into surface water or sanitary sewer system.

Conditions and measures related to sewage treatment plant		
STP type	:	Onsite Sewage Treatment Plant
STP effluent	:	2.000 m3/d

Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	Incineration / thermal oxidation cement kiln fuels
Waste - minimum efficiency of	:	99,98 %

Other conditions affecting environmental exposure		
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

1.2.2. Control of worker exposure: Other (PROC0)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Vapour pressure	:	<= 10 kPa

Technical and organisational conditions and measures
Assumes a good basic standard of occupational hygiene is implemented Handle substance within a closed system. Formulation activity is assumed to be a predominantly enclosed process.

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

Avoid direct eye contact with product, also via contamination on hands. Avoid splashing.		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Use frequency	:	Continuous process
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Use frequency	:	Continuous process
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

1.2.5. 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)

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

1.2.8. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC28)

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

1.3. Exposure estimation and reference to its source

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

Release route	Release rate	Release estimation method
Water	11,3 kg/day	measured data
Air	226 kg/day	measured data
Soil	0	measured data

Compartment	Exposure level	RCR
Freshwater	0,0672 mg/L (ECETOC TRA environment v3)	0,07
Freshwater sediment	0,258 mg/kg dry weight (ECETOC TRA environment v3)	0,072
Marine water	0,00744 mg/L (ECETOC TRA environment v3)	< 0,01
Marine sediment	0,0285 mg/kg dry weight (ECETOC TRA environment v3)	< 0,01
Agricultural soil	0,00785 mg/kg dry weight (ECETOC TRA environment v3)	0,013
Sewage treatment plant	0,714 mg/L (ECETOC TRA environment v3)	< 0,01
Man via environment - Oral	0,00047 mg/kg bw/day (ECETOC TRA environment v3)	< 0,01
Man via environment - Inhalation	0,0339 mg/kg bw/day (ECETOC TRA environment v3)	< 0,01

1.3.3. 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 level	RCR
inhalative	systemic	long-term	0,019 mg/m³ (ECETOC TRA worker v3)	< 0,001
dermal	systemic	long-term	0,03 mg/kg bw/day (ECETOC TRA worker v3)	< 0,001

1.3.4. 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 level	RCR
inhalative	systemic	long-term	9,6 mg/m³ (ECETOC TRA worker v3)	0,01
dermal	systemic	long-term	1,4 mg/kg bw/day (ECETOC TRA worker v3)	0,004

1.3.5. 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 level	RCR
inhalative	systemic	long-term	19 mg/m³ (ECETOC TRA worker v3)	0,02
dermal	systemic	long-term	0,69 mg/kg bw/day (ECETOC TRA worker v3)	0,002

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	48 mg/m³ (ECETOC TRA worker v3)	0,05
dermal	systemic	long-term	14 mg/kg bw/day (ECETOC TRA worker v3)	0,04

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	19 mg/m³ (ECETOC TRA worker v3)	0,02
dermal	systemic	long-term	0,34 mg/kg bw/day (ECETOC TRA worker v3)	< 0,001

1.3.8. Worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC28)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	96 mg/m³ (ECETOC TRA worker v3)	0,101
dermal	systemic	long-term	14 mg/kg bw/day	0,04

			(ECETOC TRA worker v3)	

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

Not relevant

ES2: Use at industrial sites; Intermediate (PC19); Various sectors (SU8, SU9).

2.1. Title section

Exposure Scenario name	:	Use as an intermediate
Structured Short Title	:	Use at industrial sites; Intermediate (PC19); Various sectors (SU8, SU9).

Environment		
CS1	**Use of intermediate**	ERC6a
Worker		
CS2	**General measures applicable to all activities**	PROC0
CS3	**Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions**	PROC1
CS4	**Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions**	PROC2
CS5	**Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition**	PROC3
CS6	**Chemical production where opportunity for exposure arises**	PROC4
CS7	**Transfer of substance or mixture (charging/discharging) at non dedicated-facilities**	PROC8a
CS8	**Transfer of substance or mixture (charging/discharging) at dedicated facilities**	PROC8b
CS9	**Use as laboratory reagent**	PROC15
CS10	**Manual maintenance (cleaning and repair) of machinery**	PROC28

2.2. Conditions of use affecting exposure

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

Product (article) characteristics		
Physical form of product	:	Liquid
Vapour pressure	:	<= 10 kPa

Amount used, frequency and duration of use (or from service life)		
Annual amount per site	:	1300000 kg
Maximum allowable site tonnage (MSafe)	:	415 tonnes/day
Release type	:	Continuous release
Emission days	:	300

Technical and organisational conditions and measures
Bund storage facilities to prevent soil and water pollution in the event of spillage. Prevent environmental discharge consistent with regulatory requirements. Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases.

Conditions and measures related to sewage treatment plant		
STP type	:	Municipal Sewage Treatment Plant
STP effluent	:	2.000 m3/d

Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	Incineration / thermal oxidation cement kiln fuels
Waste - minimum efficiency of	:	99,98 %

Other conditions affecting environmental exposure		
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

2.2.2. Control of worker exposure: Other (PROC0)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Vapour pressure	:	<= 10 kPa

Technical and organisational conditions and measures
Assumes a good basic standard of occupational hygiene is implemented Handle substance within a closed system. Formulation activity is assumed to be a predominantly enclosed process.

Conditions and measures related to personal protection, hygiene and health evaluation		
Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands. Avoid splashing.		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Use frequency	:	Continuous process
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Use frequency	:	Continuous process
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

2.2.5. 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)

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h

Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h

Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

2.2.10. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC28)

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

2.3. Exposure estimation and reference to its source

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

Release route	Release rate	Release estimation method
Water	0,003	ESVOC SPERC 6.1a.v1
Water	125 kg/day	ESVOC SPERC 6.1a.v1
Air	0,002	ESVOC SPERC 6.1a.v1
Air	83,4 kg/day	ESVOC SPERC 6.1a.v1
Soil	0,001	ESVOC SPERC 6.1a.v1

Compartment	Exposure level	RCR
Freshwater	0,72 mg/L (ECETOC TRA environment v3)	0,75
Freshwater sediment	2,76 mg/kg dry weight (ECETOC TRA environment v3)	0,767
Marine water	0,0793 mg/L (ECETOC TRA environment v3)	0,1
Marine sediment	0,304 mg/kg dry weight (ECETOC TRA environment v3)	0,105
Agricultural soil	0,00327 mg/kg dry weight (ECETOC TRA environment v3)	< 0,01
Sewage treatment plant	7,9 mg/L (ECETOC TRA environment v3)	0,014
Man via environment - Oral	0,00047 mg/kg bw/day (ECETOC	< 0,01

	TRA environment v3)	
Man via environment - Inhalation	0,00285 mg/kg bw/day (ECETOC TRA environment v3)	< 0,01

2.3.3. 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 level	RCR
inhalative	systemic	long-term	0,019 mg/m³ (ECETOC TRA worker v3)	< 0,001
dermal	systemic	long-term	0,03 mg/kg bw/day (ECETOC TRA worker v3)	< 0,001

2.3.4. 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 level	RCR
inhalative	systemic	long-term	9,6 mg/m³ (ECETOC TRA worker v3)	0,01
dermal	systemic	long-term	1,4 mg/kg bw/day (ECETOC TRA worker v3)	0,004

2.3.5. 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 level	RCR
inhalative	systemic	long-term	19 mg/m³ (ECETOC TRA worker v3)	0,02
dermal	systemic	long-term	0,69 mg/kg bw/day (ECETOC TRA worker v3)	0,002

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	38 mg/m³ (ECETOC TRA worker v3)	0,04
dermal	systemic	long-term	6,9 mg/kg bw/day (ECETOC TRA worker v3)	0,02

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	96 mg/m³ (ECETOC TRA worker v3)	0,101
dermal	systemic	long-term	14 mg/kg bw/day (ECETOC TRA worker v3)	0,04

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	48 mg/m³ (ECETOC TRA worker v3)	0,05
dermal	systemic	long-term	14 mg/kg bw/day (ECETOC TRA worker v3)	0,04

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	19 mg/m³ (ECETOC TRA worker v3)	0,02
dermal	systemic	long-term	0,34 mg/kg bw/day (ECETOC TRA worker v3)	< 0,001

2.3.10. Worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC28)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	96 mg/m³ (ECETOC TRA worker v3)	0,101
dermal	systemic	long-term	14 mg/kg bw/day (ECETOC TRA worker v3)	0,04

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

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

ES3: Use at industrial sites; Various products (PC0, PC40); Various sectors (SU8, SU9).

3.1. Title section

Exposure Scenario name	:	Use in process chemicals, Solvents, Extraction agents
Structured Short Title	:	Use at industrial sites; Various products (PC0, PC40); Various sectors (SU8, SU9).

Environment		
CS1	**Use of non-reactive processing aid at industrial site (no inclusion into or onto article)**	ERC4
Worker		
CS2	**General measures applicable to all activities**	PROC0
CS3	**Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions**	PROC1
CS4	**Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions**	PROC2
CS5	**Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition**	PROC3
CS6	**Chemical production where opportunity for exposure arises**	PROC4
CS7	**Transfer of substance or mixture (charging/discharging) at non dedicated-facilities**	PROC8a
CS8	**Transfer of substance or mixture (charging/discharging) at dedicated facilities**	PROC8b
CS9	**Use as laboratory reagent**	PROC15
CS10	**Manual maintenance (cleaning and repair) of machinery**	PROC28

3.2. Conditions of use affecting exposure

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

Product (article) characteristics		
Physical form of product	:	Liquid

Vapour pressure	:	<= 10 kPa
Amount used, frequency and duration of use (or from service life)		
Annual amount per site	:	13000000 kg
Maximum allowable site tonnage (MSafe)	:	415 tonnes/day
Release type	:	Continuous release
Emission days	:	300
Technical and organisational conditions and measures		
Bund storage facilities to prevent soil and water pollution in the event of spillage. Prevent environmental discharge consistent with regulatory requirements. Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases.		
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal Sewage Treatment Plant
STP effluent	:	2.000 m3/d
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	Incineration / thermal oxidation cement kiln fuels
Waste - minimum efficiency of	:	99,98 %
Waste treatment	:	Distillation of used process solvent
Other conditions affecting environmental exposure		
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

3.2.2. Control of worker exposure: Other (PROC0)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Vapour pressure	:	<= 10 kPa
Technical and organisational conditions and measures		
Assumes a good basic standard of occupational hygiene is implemented		

Handle substance within a closed system. Formulation activity is assumed to be a predominantly enclosed process.
Conditions and measures related to personal protection, hygiene and health evaluation
Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands. Avoid splashing.
For further specification, refer to section 8 of the SDS.
Other conditions affecting workers exposure

Temperature	:	Assumes use at not more than 20°C above ambient temperature.

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Use frequency	:	Continuous process
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Use frequency	:	Continuous process
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

3.2.5. 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)

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

Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h

Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

3.2.10. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC28)

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

3.3. Exposure estimation and reference to its source

3.3.1. 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	0,003	A&B-tables taken from TGD 2003
Water	125 kg/day	A&B-tables taken from TGD 2003
Air	0,002	A&B-tables taken from TGD 2003
Air	83,4 kg/day	A&B-tables taken from TGD 2003
Soil	0,001	A&B-tables taken from TGD 2003

Compartment	Exposure level	RCR
Freshwater	0,72 mg/L (ECETOC TRA environment v3)	0,75
Freshwater sediment	2,76 mg/kg dry weight (ECETOC TRA environment v3)	0,767
Marine water	0,0793 mg/L (ECETOC TRA environment v3)	0,1
Marine sediment	0,304 mg/kg dry weight (ECETOC TRA environment v3)	0,105
Agricultural soil	0,00327 mg/kg dry weight (ECETOC TRA environment v3)	< 0,01
Sewage treatment plant	7,9 mg/L (ECETOC TRA environment v3)	0,014

Man via environment - Oral	0,00047 mg/kg bw/day (ECETOC TRA environment v3)	< 0,01
Man via environment - Inhalation	0,00285 mg/kg bw/day (ECETOC TRA environment v3)	< 0,01

3.3.3. 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 level	RCR
inhalative	systemic	long-term	0,019 mg/m³ (ECETOC TRA worker v3)	< 0,001
dermal	systemic	long-term	0,03 mg/kg bw/day (ECETOC TRA worker v3)	< 0,001

3.3.4. 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 level	RCR
inhalative	systemic	long-term	9,6 mg/m³ (ECETOC TRA worker v3)	0,01
dermal	systemic	long-term	1,4 mg/kg bw/day (ECETOC TRA worker v3)	0,004

3.3.5. 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 level	RCR
inhalative	systemic	long-term	19 mg/m³ (ECETOC TRA worker v3)	0,02
dermal	systemic	long-term	0,69 mg/kg bw/day (ECETOC TRA worker v3)	0,002

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	38 mg/m³ (ECETOC TRA worker v3)	0,04
dermal	systemic	long-term	6,9 mg/kg bw/day (ECETOC TRA worker v3)	0,02

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	96 mg/m³ (ECETOC TRA worker v3)	0,101
dermal	systemic	long-term	14 mg/kg bw/day (ECETOC TRA worker v3)	0,04

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	48 mg/m³ (ECETOC TRA worker v3)	0,05
dermal	systemic	long-term	14 mg/kg bw/day (ECETOC TRA worker v3)	0,04

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	19 mg/m³ (ECETOC TRA worker v3)	0,02
dermal	systemic	long-term	0,34 mg/kg bw/day (ECETOC TRA	< 0,001

			worker v3)	

3.3.10. Worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC28)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	96 mg/m³ (ECETOC TRA worker v3)	0,101
dermal	systemic	long-term	14 mg/kg bw/day (ECETOC TRA worker v3)	0,04

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

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

ES4: Formulation or re-packing

4.1. Title section

Exposure Scenario name	:	Distribution of substance
Structured Short Title	:	Formulation or re-packing

Environment		
CS1	**Formulation into mixture**	ERC2
Worker		
CS2	**General measures applicable to all activities**	PROC0
CS3	**Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions**	PROC1
CS4	**Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions**	PROC2
CS5	**Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition**	PROC3
CS6	**Chemical production where opportunity for exposure arises**	PROC4
CS7	**Mixing or blending in batch processes**	PROC5
CS8	**Transfer of substance or mixture (charging/discharging) at non dedicated-facilities**	PROC8a
CS9	**Transfer of substance or mixture (charging/discharging) at dedicated facilities**	PROC8b
CS10	**Transfer of substance or mixture into small containers (dedicated filling line, including weighing)**	PROC9
CS11	**Use as laboratory reagent**	PROC15
CS12	**Manual maintenance (cleaning and repair) of machinery**	PROC28

4.2. Conditions of use affecting exposure

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

Product (article) characteristics

Physical form of product	:	Liquid
Vapour pressure	:	<= 10 kPa
Amount used, frequency and duration of use (or from service life)		
Annual amount per site	:	180000000 kg
Fraction of EU tonnage used in region	:	0,1
Fraction of regional tonnage used locally	:	0,4
Maximum allowable site tonnage (MSafe)	:	53.000 tonnes/day
Emission days	:	200
Technical and organisational conditions and measures		
Bund storage facilities to prevent soil and water pollution in the event of spillage. Prevent environmental discharge consistent with regulatory requirements. Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases.		
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal Sewage Treatment Plant
STP effluent	:	2.000 m3/d
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	Incineration / thermal oxidation cement kiln fuels
Waste - minimum efficiency of	:	99,98 %
Waste treatment	:	Distillation of used process solvent
Other conditions affecting environmental exposure		
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

4.2.2. Control of worker exposure: Other (PROC0)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Vapour pressure	:	<= 10 kPa

Technical and organisational conditions and measures		
Assumes a good basic standard of occupational hygiene is implemented Handle substance within a closed system. Formulation activity is assumed to be a predominantly enclosed process.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands. Avoid splashing.		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Use frequency	:	Continuous process
Use frequency	:	Batch process
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

4.2.5. 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)

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

4.2.12. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC28)

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

4.3. Exposure estimation and reference to its source

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

Release route	Release rate	Release estimation method
Water	0,35 kg/day	ESVOC SPERC 1.1b.v1
Air	3,5 kg/day	ESVOC SPERC 1.1b.v1
Soil	0	ESVOC SPERC 1.1b.v1

Compartment	Exposure level	RCR
Freshwater	0,00437 mg/L (ECETOC TRA environment v3)	< 0,01
Freshwater sediment	0,0168 mg/kg dry weight (ECETOC TRA environment v3)	< 0,01
Marine water	0,000522 mg/L (ECETOC TRA environment v3)	< 0,01
Marine sediment	0,002 mg/kg dry weight (ECETOC TRA environment v3)	< 0,01
Agricultural soil	0,00122 mg/kg dry weight (ECETOC TRA environment v3)	< 0,01
Sewage treatment plant	0,0212 mg/L (ECETOC TRA environment v3)	< 0,01
Man via environment - Oral	0,00047 mg/kg bw/day (ECETOC TRA environment v3)	< 0,01
Man via environment - Inhalation	0,000682 mg/kg bw/day (ECETOC TRA environment v3)	< 0,01

4.3.3. 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 level	RCR
inhalative	systemic	long-term	0,019 mg/m³ (ECETOC TRA worker v3)	< 0,001
dermal	systemic	long-term	0,03 mg/kg bw/day (ECETOC TRA worker v3)	< 0,001

4.3.4. 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 level	RCR
inhalative	systemic	long-term	9,6 mg/m³ (ECETOC TRA worker v3)	0,01
dermal	systemic	long-term	1,4 mg/kg bw/day (ECETOC TRA worker v3)	0,004

4.3.5. 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 level	RCR
inhalative	systemic	long-term	19 mg/m³ (ECETOC TRA worker v3)	0,02
dermal	systemic	long-term	0,69 mg/kg bw/day (ECETOC TRA worker v3)	0,002

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	38 mg/m³ (ECETOC TRA worker v3)	0,04
dermal	systemic	long-term	6,9 mg/kg bw/day (ECETOC TRA worker v3)	0,02

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	96 mg/m³ (ECETOC TRA worker v3)	0,101
dermal	systemic	long-term	14 mg/kg bw/day	0,04

			(ECETOC TRA worker v3)	

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	96 mg/m³ (ECETOC TRA worker v3)	0,101
dermal	systemic	long-term	14 mg/kg bw/day (ECETOC TRA worker v3)	0,04

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	48 mg/m³ (ECETOC TRA worker v3)	0,05
dermal	systemic	long-term	14 mg/kg bw/day (ECETOC TRA worker v3)	0,04

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	96 mg/m³ (ECETOC TRA worker v3)	0,101
dermal	systemic	long-term	6,9 mg/kg bw/day (ECETOC TRA worker v3)	0,02

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR

inhalative	systemic	long-term	19 mg/m³ (ECETOC TRA worker v3)	0,02
dermal	systemic	long-term	0,34 mg/kg bw/day (ECETOC TRA worker v3)	< 0,001

4.3.12. Worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC28)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	96 mg/m³ (ECETOC TRA worker v3)	0,101
dermal	systemic	long-term	14 mg/kg bw/day (ECETOC TRA worker v3)	0,04

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

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

ES5: Formulation or re-packing; Various products (PC1, PC3, PC4, PC8, PC9a, PC9b, PC9c, PC13, PC14, PC15, PC16, PC18, PC23, PC24, PC27, PC30, PC31, PC34, PC35, PC39).

5.1. Title section

Exposure Scenario name	:	Formulation & (re)packing of substances and mixtures
Structured Short Title	:	Formulation or re-packing; Various products (PC1, PC3, PC4, PC8, PC9a, PC9b, PC9c, PC13, PC14, PC15, PC16, PC18, PC23, PC24, PC27, PC30, PC31, PC34, PC35, PC39).

Environment		
CS1	**Formulation into mixture**	ERC2
Worker		
CS2	**General measures applicable to all activities**	PROC0
CS3	**Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions**	PROC1
CS4	**Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions**	PROC2
CS5	**Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition**	PROC3
CS6	**Chemical production where opportunity for exposure arises**	PROC4
CS7	**Mixing or blending in batch processes**	PROC5
CS8	**Transfer of substance or mixture (charging/discharging) at non dedicated-facilities**	PROC8a
CS9	**Transfer of substance or mixture (charging/discharging) at dedicated facilities**	PROC8b
CS10	**Transfer of substance or mixture into small containers (dedicated filling line, including weighing)**	PROC9
CS11	**Use as laboratory reagent**	PROC15
CS12	**Manual maintenance (cleaning and repair) of machinery**	PROC28

5.2. Conditions of use affecting exposure

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

Product (article) characteristics		
Physical form of product	:	Liquid
Vapour pressure	:	<= 10 kPa
Amount used, frequency and duration of use (or from service life)		
Annual amount per site	:	180000000 kg
Fraction of regional tonnage used locally	:	0,4
Maximum allowable site tonnage (MSafe)	:	1.240 tonnes/day
Release type	:	Continuous release
Emission days	:	300
Technical and organisational conditions and measures		
Bund storage facilities to prevent soil and water pollution in the event of spillage. Prevent environmental discharge consistent with regulatory requirements. Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases.		
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal Sewage Treatment Plant
STP effluent	:	2.000 m3/d
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	Incineration / thermal oxidation cement kiln fuels
Waste - minimum efficiency of	:	99,98 %
Other conditions affecting environmental exposure		
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

5.2.2. Control of worker exposure: Other (PROC0)

Product (article) characteristics	
Covers percentage substance in the product up to 100 %.	
Physical form of product	: Liquid
Vapour pressure	: <= 10 kPa
Technical and organisational conditions and measures	
Assumes a good basic standard of occupational hygiene is implemented Handle substance within a closed system. Formulation activity is assumed to be a predominantly enclosed process.	
Conditions and measures related to personal protection, hygiene and health evaluation	
Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands. Avoid splashing.	
For further specification, refer to section 8 of the SDS.	
Other conditions affecting workers exposure	
Temperature	: Assumes use at not more than 20°C above ambient temperature.

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

Amount used, frequency and duration of use (or from service life)	
Duration	: Exposure duration <= 8 h
Use frequency	: Continuous process
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

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

Amount used, frequency and duration of use (or from service life)	
Duration	: Exposure duration <= 8 h
Use frequency	: Continuous process

Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

5.2.5. 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)

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h

Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

5.2.12. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC28)

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h

Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

5.3. Exposure estimation and reference to its source

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

Release route	Release rate	Release estimation method
Water	0,001	ESVOC SPERC 2.2.v1
Water	233 kg/day	ESVOC SPERC 2.2.v1
Air	0,025	ESVOC SPERC 2.2.v1
Air	5.830 kg/day	ESVOC SPERC 2.2.v1
Soil	0	ESVOC SPERC 2.2.v1

Compartment	Exposure level	RCR
Freshwater	0,538 mg/L (ECETOC TRA environment v3)	0,56
Freshwater sediment	2,07 mg/kg dry weight (ECETOC TRA environment v3)	0,575
Marine water	0,0593 mg/L (ECETOC TRA environment v3)	0,075
Marine sediment	0,227 mg/kg dry weight (ECETOC TRA environment v3)	0,078
Agricultural soil	0,0604 mg/kg dry weight (ECETOC TRA environment v3)	0,096
Sewage treatment plant	5,9 mg/L (ECETOC TRA environment v3)	0,01
Man via environment - Oral	0,00047 mg/kg bw/day (ECETOC TRA environment v3)	< 0,01
Man via environment - Inhalation	0,294 mg/kg bw/day (ECETOC TRA environment v3)	< 0,01

5.3.3. 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 level	RCR

inhalative	systemic	long-term	0,019 mg/m³ (ECETOC TRA worker v3)	< 0,001
dermal	systemic	long-term	0,03 mg/kg bw/day (ECETOC TRA worker v3)	< 0,001

5.3.4. 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 level	RCR
inhalative	systemic	long-term	9,6 mg/m³ (ECETOC TRA worker v3)	0,01
dermal	systemic	long-term	1,4 mg/kg bw/day (ECETOC TRA worker v3)	0,004

5.3.5. 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 level	RCR
inhalative	systemic	long-term	19 mg/m³ (ECETOC TRA worker v3)	0,02
dermal	systemic	long-term	0,69 mg/kg bw/day (ECETOC TRA worker v3)	0,002

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	38 mg/m³ (ECETOC TRA worker v3)	0,04
dermal	systemic	long-term	6,9 mg/kg bw/day (ECETOC TRA worker v3)	0,02

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	96 mg/m³ (ECETOC TRA worker v3)	0,101
dermal	systemic	long-term	14 mg/kg bw/day (ECETOC TRA worker v3)	0,04

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	96 mg/m³ (ECETOC TRA worker v3)	0,101
dermal	systemic	long-term	14 mg/kg bw/day (ECETOC TRA worker v3)	0,04

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	48 mg/m³ (ECETOC TRA worker v3)	0,05
dermal	systemic	long-term	14 mg/kg bw/day (ECETOC TRA worker v3)	0,04

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	96 mg/m³ (ECETOC TRA worker v3)	0,101
dermal	systemic	long-term	6,9 mg/kg bw/day	0,02

			(ECETOC TRA worker v3)	

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	19 mg/m³ (ECETOC TRA worker v3)	0,02
dermal	systemic	long-term	0,34 mg/kg bw/day (ECETOC TRA worker v3)	< 0,001

5.3.12. Worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC28)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	96 mg/m³ (ECETOC TRA worker v3)	0,101
dermal	systemic	long-term	14 mg/kg bw/day (ECETOC TRA worker v3)	0,04

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

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

ES6: Use at industrial sites; Various products (PC1, PC4, PC9a, PC9b, PC13, PC14, PC15, PC18, PC23, PC24, PC30, PC31, PC34, PC35); Various sectors (SU5, SU15, SU16, SU17, SU18).

6.1. Title section

Exposure Scenario name	:	Solvents
Structured Short Title	:	Use at industrial sites; Various products (PC1, PC4, PC9a, PC9b, PC13, PC14, PC15, PC18, PC23, PC24, PC30, PC31, PC34, PC35); Various sectors (SU5, SU15, SU16, SU17, SU18).

Environment		
CS1	**Use of non-reactive processing aid at industrial site (no inclusion into or onto article)**	ERC4
Worker		
CS2	**General measures applicable to all activities**	PROC0
CS3	**Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions**	PROC1
CS4	**Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions**	PROC2
CS5	**Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition**	PROC3
CS6	**Chemical production where opportunity for exposure arises**	PROC4
CS7	**Mixing or blending in batch processes**	PROC5
CS8	**Industrial spraying**	PROC7
CS9	**Transfer of substance or mixture (charging/discharging) at non dedicated-facilities**	PROC8a
CS10	**Transfer of substance or mixture (charging/discharging) at dedicated facilities**	PROC8b
CS11	**Roller application or brushing**	PROC10
CS12	**Treatment of articles by dipping and pouring**	PROC13
CS13	**Use as laboratory reagent**	PROC15
CS14	**Manual maintenance (cleaning and repair) of machinery**	PROC28

6.2. Conditions of use affecting exposure

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

Product (article) characteristics		
Physical form of product	:	Liquid
Vapour pressure	:	<= 10 kPa
Amount used, frequency and duration of use (or from service life)		
Annual amount per site	:	6000000 kg
Fraction of regional tonnage used locally	:	0,5
Maximum allowable site tonnage (MSafe)	:	124 tonnes/day
Release type	:	Continuous release
Emission days	:	300
Technical and organisational conditions and measures		
Bund storage facilities to prevent soil and water pollution in the event of spillage. Prevent environmental discharge consistent with regulatory requirements.		
Treat air emissions. Air - minimum efficiency of 90 %		
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal Sewage Treatment Plant
STP effluent	:	2.000 m3/d
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	Incineration / thermal oxidation cement kiln fuels
Waste - minimum efficiency of	:	99,98 %
Other conditions affecting environmental exposure		
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

6.2.2. Control of worker exposure: Other (PROC0)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Vapour pressure	:	<= 10 kPa
Technical and organisational conditions and measures		
Assumes a good basic standard of occupational hygiene is implemented Handle substance within a closed system. Formulation activity is assumed to be a predominantly enclosed process.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands. Avoid splashing.		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Use frequency	:	Continuous process
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Use frequency	:	Continuous process

Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

6.2.5. 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)

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h

Technical and organisational conditions and measures		
Provide a good standard of controlled ventilation (10 to 15 air changes per hour).		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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

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

Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

6.2.14. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC28)

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

6.3. Exposure estimation and reference to its source

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

Release route	Release rate	Release estimation method
Water	0,01	ESVOC SPERC 4.3a.v1
Water	100 kg/day	ESVOC SPERC 4.3a.v1
Air	0,098	ESVOC SPERC 4.3a.v1
Air	980 kg/day	ESVOC SPERC 4.3a.v1
Soil	0	ESVOC SPERC 4.3a.v1

Compartment	Exposure level	RCR
Freshwater	0,577 mg/L (ECETOC TRA	0,601

	environment v3)	
Freshwater sediment	2,21 mg/kg dry weight (ECETOC TRA environment v3)	0,614
Marine water	0,0635 mg/L (ECETOC TRA environment v3)	0,080
Marine sediment	0,244 mg/kg dry weight (ECETOC TRA environment v3)	0,084
Agricultural soil	0,0525 mg/kg dry weight (ECETOC TRA environment v3)	0,084
Sewage treatment plant	6,32 mg/L (ECETOC TRA environment v3)	0,011
Man via environment - Oral	0,00047 mg/kg bw/day (ECETOC TRA environment v3)	< 0,01
Man via environment - Inhalation	0,133 mg/kg bw/day (ECETOC TRA environment v3)	< 0,01

6.3.3. 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 level	RCR
inhalative	systemic	long-term	0,019 mg/m³ (ECETOC TRA worker v3)	< 0,001
dermal	systemic	long-term	0,03 mg/kg bw/day (ECETOC TRA worker v3)	< 0,001

6.3.4. 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 level	RCR
inhalative	systemic	long-term	9,6 mg/m³ (ECETOC TRA worker v3)	0,01
dermal	systemic	long-term	1,4 mg/kg bw/day (ECETOC TRA worker v3)	0,004

6.3.5. 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 level	RCR
inhalative	systemic	long-term	19 mg/m³ (ECETOC TRA worker v3)	0,02
dermal	systemic	long-term	0,69 mg/kg bw/day (ECETOC TRA worker v3)	0,002

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	38 mg/m³ (ECETOC TRA worker v3)	0,04
dermal	systemic	long-term	6,9 mg/kg bw/day (ECETOC TRA worker v3)	0,02

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	96 mg/m³ (ECETOC TRA worker v3)	0,101
dermal	systemic	long-term	14 mg/kg bw/day (ECETOC TRA worker v3)	0,04

6.3.8. Worker exposure: Industrial spraying (PROC7)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	140 mg/m³ (ECETOC TRA worker v3)	0,151
dermal	systemic	long-term	43 mg/kg bw/day (ECETOC TRA	0,126

			worker v3)	

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	96 mg/m³ (ECETOC TRA worker v3)	0,101
dermal	systemic	long-term	14 mg/kg bw/day (ECETOC TRA worker v3)	0,04

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	48 mg/m³ (ECETOC TRA worker v3)	0,05
dermal	systemic	long-term	14 mg/kg bw/day (ECETOC TRA worker v3)	0,04

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	96 mg/m³ (ECETOC TRA worker v3)	0,101
dermal	systemic	long-term	27 mg/kg bw/day (ECETOC TRA worker v3)	0,08

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	96 mg/m³ (ECETOC TRA	0,101

			worker v3)	
dermal	systemic	long-term	14 mg/kg bw/day (ECETOC TRA worker v3)	0,04

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	19 mg/m³ (ECETOC TRA worker v3)	0,02
dermal	systemic	long-term	0,34 mg/kg bw/day (ECETOC TRA worker v3)	< 0,001

6.3.14. Worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC28)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	96 mg/m³ (ECETOC TRA worker v3)	0,101
dermal	systemic	long-term	14 mg/kg bw/day (ECETOC TRA worker v3)	0,04

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

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

ES7: Widespread use by professional workers; Various products (PC1, PC4, PC8, PC9a, PC9b, PC9c, PC13, PC18, PC23, PC24, PC27, PC31, PC34, PC35); Various sectors (SU0, SU15, SU16, SU17).

7.1. Title section

Exposure Scenario name	:	Solvents
Structured Short Title	:	Widespread use by professional workers; Various products (PC1, PC4, PC8, PC9a, PC9b, PC9c, PC13, PC18, PC23, PC24, PC27, PC31, PC34, PC35); Various sectors (SU0, SU15, SU16, SU17).

Environment		
CS1	**Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor), Wide dispersive outdoor use of processing aids in open systems**	ERC8a, ERC8d
Worker		
CS2	**General measures applicable to all activities**	PROC0
CS3	**Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions**	PROC1
CS4	**Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions**	PROC2
CS5	**Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition**	PROC3
CS6	**Chemical production where opportunity for exposure arises**	PROC4
CS7	**Mixing or blending in batch processes**	PROC5
CS8	**Transfer of substance or mixture (charging/discharging) at non dedicated-facilities**	PROC8a
CS9	**Roller application or brushing**	PROC10
CS10	**Non-industrial spraying, Indoor**	PROC11
CS11	**Non-industrial spraying, Outdoor**	PROC11
CS12	**Treatment of articles by dipping and pouring**	PROC13
CS13	**Manual activities involving hand contact**	PROC19
CS14	**Manual maintenance (cleaning and repair) of machinery**	PROC28

7.2. Conditions of use affecting exposure

7.2.1. Control of environmental exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a) / Wide dispersive outdoor use of processing aids in open systems (ERC8d)

Product (article) characteristics		
Physical form of product	:	Liquid
Vapour pressure	:	<= 10 kPa
Amount used, frequency and duration of use (or from service life)		
Annual amount per site	:	2000000 kg
Fraction of EU tonnage used in region	:	0,1
Fraction of regional tonnage used locally	:	0,0005
Maximum allowable site tonnage (MSafe)	:	715 kg/day
Release type	:	Continuous release
Emission days	:	365
Technical and organisational conditions and measures		
Prevent environmental discharge consistent with regulatory requirements.		
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal Sewage Treatment Plant
STP effluent	:	2.000 m3/d
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	Incineration / thermal oxidation
Waste - minimum efficiency of	:	99,98 %
Other conditions affecting environmental exposure		
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

7.2.2. Control of worker exposure: Other (PROC0)

Product (article) characteristics	
Covers percentage substance in the product up to 100 %.	
Physical form of product	: Liquid
Technical and organisational conditions and measures	
Assumes a good basic standard of occupational hygiene is implemented Keep container tightly closed.	
Conditions and measures related to personal protection, hygiene and health evaluation	
Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands. Avoid splashing.	
For further specification, refer to section 8 of the SDS.	

7.2.3. 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	
Vapour pressure	: <= 10 kPa
Amount used, frequency and duration of use (or from service life)	
Duration	: Exposure duration <= 8 h
Use frequency	: Continuous process
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use
Temperature	: Assumes use at not more than 20°C above ambient temperature.

7.2.4. 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	
Vapour pressure	: <= 10 kPa
Amount used, frequency and duration of use (or from service life)	
Duration	: Exposure duration <= 8 h

Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes use at not more than 20°C above ambient temperature.

7.2.5. 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		
Vapour pressure	:	<= 10 kPa
Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes use at not more than 20°C above ambient temperature.

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

Product (article) characteristics		
Vapour pressure	:	<= 10 kPa
Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes use at not more than 20°C above ambient temperature.

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

Product (article) characteristics		
Vapour pressure	:	<= 10 kPa
Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes use at not more than 20°C above ambient temperature.

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

Product (article) characteristics		
Vapour pressure	:	<= 10 kPa
Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes use at not more than 20°C above ambient temperature.

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

Product (article) characteristics		
Vapour pressure	:	<= 10 kPa
Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes use at not more than 20°C above ambient

temperature.

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

Product (article) characteristics		
Vapour pressure	:	<= 10 kPa
Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Technical and organisational conditions and measures		
Provide a good standard of controlled ventilation (10 to 15 air changes per hour).		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes use at not more than 20°C above ambient temperature.

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

Product (article) characteristics		
Vapour pressure	:	<= 10 kPa
Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
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		
Indoor or outdoor use	:	Outdoor use
Temperature	:	Assumes use at not more than 20°C above ambient temperature.

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

Product (article) characteristics		
Vapour pressure	:	<= 10 kPa
Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes use at not more than 20°C above ambient temperature.

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

Product (article) characteristics		
Vapour pressure	:	<= 10 kPa
Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes use at not more than 20°C above ambient temperature.

7.2.14. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC28)

Product (article) characteristics		
Vapour pressure	:	<= 10 kPa
Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes use at not more than 20°C above ambient

temperature.

7.3. Exposure estimation and reference to its source

7.3.1. Environmental release and exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a) / Wide dispersive outdoor use of processing aids in open systems (ERC8d)

Release route	Release rate	Release estimation method
Water	0,01	ESVOC SPERC 8.3b.v1
Water	2,74 g/d	ESVOC SPERC 8.3b.v1
Air	0,98	ESVOC SPERC 8.3b.v1
Soil	0,01	ESVOC SPERC 8.3b.v1

Compartment	Exposure level	RCR
Freshwater	0,00238 mg/L (ECETOC TRA environment v3)	< 0,01
Freshwater sediment	0,00912 mg/kg dry weight (ECETOC TRA environment v3)	< 0,01
Marine water	0,000303 mg/L (ECETOC TRA environment v3)	< 0,01
Marine sediment	0,00116 mg/kg dry weight (ECETOC TRA environment v3)	< 0,01
Agricultural soil	0,00116 mg/kg dry weight (ECETOC TRA environment v3)	< 0,01
Sewage treatment plant	0,000173 mg/L (ECETOC TRA environment v3)	< 0,01
Man via environment - Oral	0,00047 mg/kg bw/day (ECETOC TRA environment v3)	< 0,01
Man via environment - Inhalation	0,00039 mg/kg bw/day (ECETOC TRA environment v3)	< 0,01

7.3.3. 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 level	RCR
inhalative	systemic	long-term	0,019 mg/m³ (ECETOC TRA	< 0,001

			worker v3)	
dermal	systemic	long-term	0,03 mg/kg bw/day (ECETOC TRA worker v3)	< 0,001

7.3.4. 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 level	RCR
inhalative	systemic	long-term	38 mg/m³ (ECETOC TRA worker v3)	0,04
dermal	systemic	long-term	1,4 mg/kg bw/day (ECETOC TRA worker v3)	0,004

7.3.5. 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 level	RCR
inhalative	systemic	long-term	48 mg/m³ (ECETOC TRA worker v3)	0,05
dermal	systemic	long-term	0,69 mg/kg bw/day (ECETOC TRA worker v3)	0,002

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	96 mg/m³ (ECETOC TRA worker v3)	0,101
dermal	systemic	long-term	6,9 mg/kg bw/day (ECETOC TRA worker v3)	0,02

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	190 mg/m³ (ECETOC TRA worker v3)	0,202
dermal	systemic	long-term	14 mg/kg bw/day (ECETOC TRA worker v3)	0,04

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	190 mg/m³ (ECETOC TRA worker v3)	0,202
dermal	systemic	long-term	14 mg/kg bw/day (ECETOC TRA worker v3)	0,04

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	190 mg/m³ (ECETOC TRA worker v3)	0,202
dermal	systemic	long-term	27 mg/kg bw/day (ECETOC TRA worker v3)	0,08

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	290 mg/m³ (ECETOC TRA worker v3)	0,303
dermal	systemic	long-term	110 mg/kg bw/day (ECETOC TRA worker v3)	0,314

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	67 mg/m³ (ECETOC TRA worker v3)	0,071
dermal	systemic	long-term	110 mg/kg bw/day (ECETOC TRA worker v3)	0,314

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	190 mg/m³ (ECETOC TRA worker v3)	0,202
dermal	systemic	long-term	14 mg/kg bw/day (ECETOC TRA worker v3)	0,04

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	190 mg/m³ (ECETOC TRA worker v3)	0,202
dermal	systemic	long-term	140 mg/kg bw/day (ECETOC TRA worker v3)	0,415

7.3.14. Worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC28)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	190 mg/m³ (ECETOC TRA worker v3)	0,202
dermal	systemic	long-term	14 mg/kg bw/day (ECETOC TRA worker v3)	0,04

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

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

ES8: Use at industrial sites; Heat transfer fluids (PC16).

8.1. Title section

Exposure Scenario name	:	Use in functional fluids
Structured Short Title	:	Use at industrial sites; Heat transfer fluids (PC16).

Environment		
CS1	**Use of functional fluid at industrial site**	ERC7
Worker		
CS2	**General measures applicable to all activities**	PROC0
CS3	**Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions**	PROC1
CS4	**Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions**	PROC2
CS5	**Transfer of substance or mixture (charging/discharging) at non dedicated-facilities**	PROC8a
CS6	**Transfer of substance or mixture (charging/discharging) at dedicated facilities**	PROC8b
CS7	**Manual maintenance (cleaning and repair) of machinery**	PROC28

8.2. Conditions of use affecting exposure

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

Product (article) characteristics		
Physical form of product	:	Liquid
Vapour pressure	:	<= 10 kPa
Amount used, frequency and duration of use (or from service life)		
Annual amount per site	:	1000000 kg
Fraction of regional tonnage used locally	:	0,01
Maximum allowable site tonnage	:	640 tonnes/day

(MSafe)		
Release type	:	Intermittent release
Emission days	:	20
Technical and organisational conditions and measures		
Bund storage facilities to prevent soil and water pollution in the event of spillage. Prevent environmental discharge consistent with regulatory requirements.		
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal Sewage Treatment Plant
STP effluent	:	2.000 m3/d
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	Incineration / thermal oxidation Biological waste water treatment plant Distillation of used process solvent
Other conditions affecting environmental exposure		
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

8.2.2. Control of worker exposure: Other (PROC0)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Technical and organisational conditions and measures		
Assumes a good basic standard of occupational hygiene is implemented Keep container tightly closed.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands. Avoid splashing.		
For further specification, refer to section 8 of the SDS.		

8.2.3. 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		
Vapour pressure	:	> 10 kPa
Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Use frequency	:	Batch process
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 60 °C

8.2.4. 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		
Vapour pressure	:	<= 10 kPa
Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes use at not more than 20°C above ambient temperature.

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

Product (article) characteristics		
Vapour pressure	:	<= 10 kPa
Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		

Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes use at not more than 20°C above ambient temperature.

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

Product (article) characteristics		
Vapour pressure	:	<= 10 kPa
Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes use at not more than 20°C above ambient temperature.

8.2.7. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC28)

Product (article) characteristics		
Vapour pressure	:	<= 10 kPa
Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes use at not more than 20°C above ambient temperature.

8.3. Exposure estimation and reference to its source

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

Release route	Release rate	Release estimation method

Water	0,001	ESVOC SPERC 7.13a.v1
Water	0,5 kg/day	ESVOC SPERC 7.13a.v1
Air	0,01	ESVOC SPERC 7.13a.v1
Air	5 kg/day	ESVOC SPERC 7.13a.v1
Soil	0,001	ESVOC SPERC 7.13a.v1

Compartment	Exposure level	RCR
Freshwater	0,00552 mg/L (ECETOC TRA environment v3)	< 0,01
Freshwater sediment	0,0212 mg/kg dry weight (ECETOC TRA environment v3)	< 0,01
Marine water	0,000617 mg/L (ECETOC TRA environment v3)	< 0,01
Marine sediment	0,00237 mg/kg dry weight (ECETOC TRA environment v3)	< 0,01
Agricultural soil	0,0013 mg/kg dry weight (ECETOC TRA environment v3)	< 0,01
Sewage treatment plant	0,0316 mg/L (ECETOC TRA environment v3)	< 0,01
Man via environment - Oral	0,00047 mg/kg bw/day (ECETOC TRA environment v3)	< 0,01
Man via environment - Inhalation	0,000438 mg/kg bw/day (ECETOC TRA environment v3)	< 0,01

8.3.3. 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 level	RCR
inhalative	systemic	long-term	0,019 mg/m³ (ECETOC TRA worker v3)	< 0,001
dermal	systemic	long-term	0,03 mg/kg bw/day (ECETOC TRA worker v3)	< 0,001

8.3.4. 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 level	RCR

inhalative	systemic	long-term	9,6 mg/m³ (ECETOC TRA worker v3)	0,01
dermal	systemic	long-term	1,4 mg/kg bw/day (ECETOC TRA worker v3)	0,004

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	96 mg/m³ (ECETOC TRA worker v3)	0,101
dermal	systemic	long-term	14 mg/kg bw/day (ECETOC TRA worker v3)	0,04

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	48 mg/m³ (ECETOC TRA worker v3)	0,05
dermal	systemic	long-term	14 mg/kg bw/day (ECETOC TRA worker v3)	0,04

8.3.7. Worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC28)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	96 mg/m³ (ECETOC TRA worker v3)	0,101
dermal	systemic	long-term	14 mg/kg bw/day (ECETOC TRA worker v3)	0,04

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

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

ES9: Widespread use by professional workers; Heat transfer fluids (PC16); Building and construction work (SU19).

9.1. Title section

Exposure Scenario name	:	Use in functional fluids
Structured Short Title	:	Widespread use by professional workers; Heat transfer fluids (PC16); Building and construction work (SU19).

Environment		
CS1	**Widespread use of functional fluid (indoor), Widespread use of functional fluid (outdoor)**	ERC9a, ERC9b
Worker		
CS2	**General measures applicable to all activities**	PROC0
CS3	**Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions**	PROC1
CS4	**Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions**	PROC2
CS5	**Transfer of substance or mixture (charging/discharging) at non dedicated-facilities**	PROC8a
CS6	**Use of functional fluids in small devices**	PROC20
CS7	**Manual maintenance (cleaning and repair) of machinery**	PROC28

9.2. Conditions of use affecting exposure

9.2.1. Control of environmental exposure: Widespread use of functional fluid (indoor) (ERC9a) / Widespread use of functional fluid (outdoor) (ERC9b)

Product (article) characteristics		
Physical form of product	:	Liquid
Vapour pressure	:	<= 10 kPa
Amount used, frequency and duration of use (or from service life)		
Annual amount per site	:	1000000 kg
Fraction of regional tonnage used	:	0,0005

locally		
Regional use tonnage	:	0,1
Maximum allowable site tonnage (MSafe)	:	357 kg/day
Release type	:	Continuous release
Emission days	:	365

Technical and organisational conditions and measures
Prevent environmental discharge consistent with regulatory requirements.

Conditions and measures related to sewage treatment plant		
STP type	:	Municipal Sewage Treatment Plant
STP effluent	:	2.000 m3/d

Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	Incineration / thermal oxidation Distillation of used process solvent

Other conditions affecting environmental exposure		
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

9.2.2. Control of worker exposure: Other (PROC0)

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

Technical and organisational conditions and measures
Assumes a good basic standard of occupational hygiene is implemented Keep container tightly closed.

Conditions and measures related to personal protection, hygiene and health evaluation
Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands. Avoid splashing.
For further specification, refer to section 8 of the SDS.

9.2.3. 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		
Vapour pressure	:	> 10 kPa
Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Use frequency	:	Continuous process
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 60 °C

9.2.4. 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		
Vapour pressure	:	<= 10 kPa
Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes use at not more than 20°C above ambient temperature.

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

Product (article) characteristics		
Vapour pressure	:	<= 10 kPa
Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h

Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes use at not more than 20°C above ambient temperature.

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

Product (article) characteristics		
Vapour pressure	:	<= 10 kPa
Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes use at not more than 20°C above ambient temperature.

9.2.7. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC28)

Product (article) characteristics		
Vapour pressure	:	<= 10 kPa
Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes use at not more than 20°C above ambient temperature.

9.3. Exposure estimation and reference to its source

9.3.1. Environmental release and exposure: Widespread use of functional fluid (indoor) (ERC9a) / Widespread use of functional fluid (outdoor) (ERC9b)

Release route	Release rate	Release estimation method
Water	0,025	ESVOC SPERC 7.13a.v1
Water	3,43 g/d	ESVOC SPERC 7.13a.v1
Air	0,05	ESVOC SPERC 7.13a.v1
Soil	0,025	ESVOC SPERC 7.13a.v1

Compartment	Exposure level	RCR
Freshwater	0,00238 mg/L (ECETOC TRA environment v3)	< 0,01
Freshwater sediment	0,00914 mg/kg dry weight (ECETOC TRA environment v3)	< 0,01
Marine water	0,000303 mg/L (ECETOC TRA environment v3)	< 0,01
Marine sediment	0,00116 mg/kg dry weight (ECETOC TRA environment v3)	< 0,01
Agricultural soil	0,00116 mg/kg dry weight (ECETOC TRA environment v3)	< 0,01
Sewage treatment plant	0,000216 mg/L (ECETOC TRA environment v3)	< 0,01
Man via environment - Oral	0,00047 mg/kg bw/day (ECETOC TRA environment v3)	< 0,01
Man via environment - Inhalation	0,00039 mg/kg bw/day (ECETOC TRA environment v3)	< 0,01

9.3.3. 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 level	RCR
inhalative	systemic	long-term	0,019 mg/m³ (ECETOC TRA worker v3)	< 0,001
dermal	systemic	long-term	0,03 mg/kg bw/day (ECETOC TRA worker v3)	< 0,001

9.3.4. 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 level	RCR
inhalative	systemic	long-term	38 mg/m³ (ECETOC TRA worker v3)	0,04
dermal	systemic	long-term	1,4 mg/kg bw/day (ECETOC TRA worker v3)	0,004

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	190 mg/m³ (ECETOC TRA worker v3)	0,202
dermal	systemic	long-term	14 mg/kg bw/day (ECETOC TRA worker v3)	0,04

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	38 mg/m³ (ECETOC TRA worker v3)	0,04
dermal	systemic	long-term	1,7 mg/kg bw/day (ECETOC TRA worker v3)	0,005

9.3.7. Worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC28)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	190 mg/m³ (ECETOC TRA worker v3)	0,202
dermal	systemic	long-term	14 mg/kg bw/day (ECETOC TRA	0,04

			worker v3)	

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

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

ES10: Widespread use by professional workers; Various products (PC16, PC21); Scientific research and development (SU24).

10.1. Title section

Exposure Scenario name	:	Use in laboratories
Structured Short Title	:	Widespread use by professional workers; Various products (PC16, PC21); Scientific research and development (SU24).

Environment		
CS1	**Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)**	ERC8a
Worker		
CS2	**General measures applicable to all activities**	PROC0
CS3	**Roller application or brushing**	PROC10
CS4	**Use as laboratory reagent**	PROC15

10.2. Conditions of use affecting exposure

10.2.1. Control of environmental exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a)

Product (article) characteristics		
Physical form of product	:	Liquid
Vapour pressure	:	<= 10 kPa
Amount used, frequency and duration of use (or from service life)		
Annual amount per site	:	200000 kg
Fraction of EU tonnage used in region	:	0,1
Fraction of regional tonnage used locally	:	0,0005
Maximum allowable site tonnage (MSafe)	:	35,4 kg/day
Release type	:	Continuous release
Emission days	:	365

Technical and organisational conditions and measures		
Prevent environmental discharge consistent with regulatory requirements.		
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal Sewage Treatment Plant
STP effluent	:	2.000 m3/d
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	Incineration / thermal oxidation
Other conditions affecting environmental exposure		
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

10.2.2. Control of worker exposure: Other (PROC0)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Technical and organisational conditions and measures		
Assumes a good basic standard of occupational hygiene is implemented Keep container tightly closed.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands. Avoid splashing.		
For further specification, refer to section 8 of the SDS.		

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

Product (article) characteristics		
Vapour pressure	:	<= 10 kPa
Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h

Use frequency	:	Continuous process
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes use at not more than 20°C above ambient temperature.

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

Product (article) characteristics		
Vapour pressure	:	<= 10 kPa
Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes use at not more than 20°C above ambient temperature.

10.3. Exposure estimation and reference to its source

10.3.1. Environmental release and exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a)

Release route	Release rate	Release estimation method
Water	0,5	ESVOC SPERC 8.17.v1
Water	13,7 g/d	ESVOC SPERC 8.17.v1
Air	0,5	ESVOC SPERC 8.17.v1
Soil	0	ESVOC SPERC 8.17.v1

Compartment	Exposure level	RCR
Freshwater	0,0024 mg/L (ECETOC TRA environment v3)	< 0,01
Freshwater sediment	0,00922 mg/kg dry weight (ECETOC TRA environment v3)	< 0,01
Marine water	0,000305 mg/L (ECETOC TRA	< 0,01

	environment v3)	
Marine sediment	0,00117 mg/kg dry weight (ECETOC TRA environment v3)	< 0,01
Agricultural soil	0,00116 mg/kg dry weight (ECETOC TRA environment v3)	< 0,01
Sewage treatment plant	0,000433 mg/L (ECETOC TRA environment v3)	< 0,01
Man via environment - Oral	0,00047 mg/kg bw/day (ECETOC TRA environment v3)	< 0,01
Man via environment - Inhalation	0,00039 mg/kg bw/day (ECETOC TRA environment v3)	< 0,01

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	190 mg/m³ (ECETOC TRA worker v3)	0,202
dermal	systemic	long-term	27 mg/kg bw/day (ECETOC TRA worker v3)	0,08

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	19 mg/m³ (ECETOC TRA worker v3)	0,02
dermal	systemic	long-term	0,34 mg/kg bw/day (ECETOC TRA worker v3)	< 0,001

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

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

ES11: Consumer use; Various products (PC1, PC3, PC8, PC18, PC23, PC24, PC27, PC31, PC34).

11.1. Title section

Exposure Scenario name	:	Use in products containing small quantities of substance
Structured Short Title	:	Consumer use; Various products (PC1, PC3, PC8, PC18, PC23, PC24, PC27, PC31, PC34).

Environment		
CS1	**Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)**	ERC8a
CS2	**Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)**	ERC8d
Consumer		
CS3	**Glues, hobby use**	PC1
CS4	**Glue from spray**	PC1
CS5	**Sealants**	PC1
CS6	**Air care, instant action (aerosol sprays)**	PC3
CS7	**Air care, continuous action (solid and liquid)**	PC3
CS8	**Laundry and dish washing products**	PC8
CS9	**Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)**	PC8
CS10	**Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)**	PC8
CS11	**Ink and toners**	PC18
CS12	**Polishes, wax / cream (floor, furniture, shoes)**	PC23
CS13	**Polishes, spray (furniture, shoes)**	PC23
CS14	**Liquids**	PC24
CS15	**Plant protection products**	PC27
CS16	**Polishes, wax / cream (floor, furniture, shoes)**	PC31
CS17	**Polishes, spray (furniture, shoes)**	PC31
CS18	**Textile dyes and impregnating products**	PC34

11.2. Conditions of use affecting exposure

11.2.1. Control of environmental exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a)

Amount used, frequency and duration of use (or from service life)		
Annual amount per site	:	1000000 kg
Fraction of EU tonnage used in region	:	0,1
Fraction of regional tonnage used locally	:	0,002
Emission days	:	365
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	Incineration / thermal oxidation
Waste - minimum efficiency of	:	99,8 %
Waste treatment	:	Landfill
Other conditions affecting environmental exposure		
Local freshwater dilution factor		
Local marine water dilution factor		

11.2.2. Control of environmental exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) (ERC8d)

Amount used, frequency and duration of use (or from service life)		
Annual amount per site	:	1000000 kg
Fraction of EU tonnage used in region	:	0,1
Fraction of regional tonnage used locally	:	0,002
Emission days	:	365
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	Incineration / thermal oxidation
Waste - minimum efficiency of	:	99,8 %
Waste treatment	:	Landfill

Other conditions affecting environmental exposure
Local freshwater dilution factor
Local marine water dilution factor

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

Product (article) characteristics		
Covers concentrations up to 70 %		
Physical form of product	:	High volatile liquid
Vapour pressure	:	5726 Pa
Amount used, frequency and duration of use (or from service life)		
Amount used per event	:	<= 50 g/event
Duration	:	Covers exposure up to 4 h
Use frequency	:	1 events per day
Conditions and measures related to personal protection, hygiene and health evaluation		
Avoid direct eye contact with product, also via contamination on hands.		
Other conditions affecting consumers exposure		
Body parts exposed	:	Assumes that potential dermal contact is limited to fingertips.
Room size	:	Covers use in room size of 20 m3
Temperature	:	Covers use at ambient temperatures.
Ventilation rate	:	Covers use under typical household ventilation.

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

Product (article) characteristics		
Covers concentrations up to 30 %		
Physical form of product	:	High volatile liquid
Vapour pressure	:	5726 Pa
Amount used, frequency and duration of use (or from service life)		
Amount used per event	:	<= 50 g/event
Duration	:	Covers exposure up to 4 h

Use frequency	:	6 times per year
Conditions and measures related to personal protection, hygiene and health evaluation		
Avoid direct eye contact with product, also via contamination on hands.		
Other conditions affecting consumers exposure		
Body parts exposed	:	Assumes that potential dermal contact is limited to fingertips.
Room size	:	Covers use in room size of 20 m3
Temperature	:	Covers use at ambient temperatures.
Ventilation rate	:	Covers use under typical household ventilation.

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

Product (article) characteristics		
Covers concentrations up to 30 %		
Physical form of product	:	High volatile liquid
Vapour pressure	:	5726 Pa
Amount used, frequency and duration of use (or from service life)		
Amount used per event	:	<= 50 g/event
Duration	:	Covers exposure up to 1 h
Use frequency	:	1 events per day
Conditions and measures related to personal protection, hygiene and health evaluation		
Avoid direct eye contact with product, also via contamination on hands.		
Other conditions affecting consumers exposure		
Body parts exposed	:	Assumes that potential dermal contact is limited to fingertips.
Room size	:	Covers use in room size of 20 m3
Temperature	:	Covers use at ambient temperatures.
Ventilation rate	:	Covers use under typical household ventilation.

11.2.6. Control of consumer exposure: Air care products (PC3)

Product (article) characteristics
Covers concentrations up to 85 %

Physical form of product	:	High volatile liquid
Vapour pressure	:	5726 Pa
Amount used, frequency and duration of use (or from service life)		
Amount used per event	:	<= 10 g/event
Duration	:	Covers exposure up to 0,3 h
Use frequency	:	5 events per day
Conditions and measures related to personal protection, hygiene and health evaluation		
Avoid direct eye contact with product, also via contamination on hands.		
Other conditions affecting consumers exposure		
Body parts exposed	:	Assumes that potential dermal contact is limited to fingertips.
Room size	:	Covers use in room size of 20 m3
Temperature	:	Covers use at ambient temperatures.
Ventilation rate	:	Covers use under typical household ventilation.

11.2.7. Control of consumer exposure: Air care products (PC3)

Product (article) characteristics		
Covers concentrations up to 85 %		
Physical form of product	:	High volatile liquid
Vapour pressure	:	5726 Pa
Amount used, frequency and duration of use (or from service life)		
Amount used per event	:	<= 0,48 g/event
Duration	:	Covers exposure up to 24 h
Use frequency	:	1 events per day
Conditions and measures related to personal protection, hygiene and health evaluation		
Avoid direct eye contact with product, also via contamination on hands.		
Other conditions affecting consumers exposure		
Body parts exposed	:	Assumes that potential dermal contact is limited to fingertips.
Room size	:	Covers use in room size of 20 m3
Temperature	:	Covers use at ambient temperatures.

Ventilation rate	:	Covers use under typical household ventilation.

11.2.8. Control of consumer exposure: Biocidal products (PC8)

Product (article) characteristics		
Covers concentrations up to 5 %		
Physical form of product	:	High volatile liquid
Vapour pressure	:	5726 Pa
Amount used, frequency and duration of use (or from service life)		
Amount used per event	:	<= 50 g/event
Duration	:	Covers exposure up to 0,5 h
Use frequency	:	1 events per day
Conditions and measures related to personal protection, hygiene and health evaluation		
Avoid direct eye contact with product, also via contamination on hands. Dilution factor assumed before use: 0.01		
Other conditions affecting consumers exposure		
Body parts exposed	:	Assumes that potential dermal contact is limited to hands.
Room size	:	Covers use in room size of 20 m3
Temperature	:	Covers use at ambient temperatures.
Ventilation rate	:	Covers use under typical household ventilation.

11.2.9. Control of consumer exposure: Biocidal products (PC8)

Product (article) characteristics		
Covers concentrations up to 5 %		
Physical form of product	:	High volatile liquid
Vapour pressure	:	5726 Pa
Amount used, frequency and duration of use (or from service life)		
Amount used per event	:	<= 50 g/event
Duration	:	Covers exposure up to 0,3 h
Use frequency	:	125 times per year

Conditions and measures related to personal protection, hygiene and health evaluation		
Avoid direct eye contact with product, also via contamination on hands.		
Other conditions affecting consumers exposure		
Body parts exposed	:	Assumes that potential dermal contact is limited to hands.
Room size	:	Covers use in room size of 20 m3
Temperature	:	Covers use at ambient temperatures.
Ventilation rate	:	Covers use under typical household ventilation.

11.2.10. Control of consumer exposure: Biocidal products (PC8)

Product (article) characteristics		
Covers concentrations up to 90 %		
Physical form of product	:	High volatile liquid
Vapour pressure	:	5726 Pa
Amount used, frequency and duration of use (or from service life)		
Amount used per event	:	<= 16,7 g/event
Duration	:	Covers exposure up to 0,2 h
Use frequency	:	3 events per day
Conditions and measures related to personal protection, hygiene and health evaluation		
Avoid direct eye contact with product, also via contamination on hands.		
Other conditions affecting consumers exposure		
Body parts exposed	:	Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.
Room size	:	Covers use in room size of 20 m3
Temperature	:	Covers use at ambient temperatures.
Ventilation rate	:	Covers use under typical household ventilation.

11.2.11. Control of consumer exposure: Ink and toners (PC18)

Product (article) characteristics
Covers concentrations up to 50 %

Physical form of product	:	High volatile liquid
Vapour pressure	:	5726 Pa
Amount used, frequency and duration of use (or from service life)		
Amount used per event	:	<= 50 g/event
Duration	:	Covers exposure up to 8 h
Use frequency	:	1 events per day
Conditions and measures related to personal protection, hygiene and health evaluation		
Avoid direct eye contact with product, also via contamination on hands.		
Other conditions affecting consumers exposure		
Body parts exposed	:	Assumes that potential dermal contact is limited to fingertips. Both hands
Room size	:	Covers use in room size of 20 m3
Temperature	:	Covers use at ambient temperatures.
Ventilation rate	:	Covers use under typical household ventilation.

11.2.12. Control of consumer exposure: Leather treatment products (PC23)

Product (article) characteristics		
Covers concentrations up to 50 %		
Physical form of product	:	High volatile liquid
Vapour pressure	:	5726 Pa
Amount used, frequency and duration of use (or from service life)		
Amount used per event	:	<= 50 g/event
Duration	:	Covers exposure up to 1,2 h
Use frequency	:	29 times per year
Conditions and measures related to personal protection, hygiene and health evaluation		
Avoid direct eye contact with product, also via contamination on hands.		
Other conditions affecting consumers exposure		
Body parts exposed	:	Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.
Room size	:	Covers use in room size of 20 m3

Temperature	:	Covers use at ambient temperatures.
Ventilation rate	:	Covers use under typical household ventilation.

11.2.13. Control of consumer exposure: Leather treatment products (PC23)

Product (article) characteristics		
Covers concentrations up to 20 %		
Physical form of product	:	High volatile liquid
Vapour pressure	:	5726 Pa
Amount used, frequency and duration of use (or from service life)		
Amount used per event	:	<= 50 g/event
Duration	:	Covers exposure up to 0,3 h
Use frequency	:	8 times per year
Conditions and measures related to personal protection, hygiene and health evaluation		
Avoid direct eye contact with product, also via contamination on hands.		
Other conditions affecting consumers exposure		
Body parts exposed	:	Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.
Room size	:	Covers use in room size of 20 m3
Temperature	:	Covers use at ambient temperatures.
Ventilation rate	:	Covers use under typical household ventilation.

11.2.14. Control of consumer exposure: Lubricants, greases, release products (PC24)

Product (article) characteristics		
Covers concentrations up to 20 %		
Physical form of product	:	High volatile liquid
Vapour pressure	:	5726 Pa
Amount used, frequency and duration of use (or from service life)		
Amount used per event	:	<= 50 g/event
Duration	:	Covers exposure up to 0,2 h

Use frequency	:	4 times per year
Conditions and measures related to personal protection, hygiene and health evaluation		
Avoid direct eye contact with product, also via contamination on hands. dermal transfer factor: 0.1		
Other conditions affecting consumers exposure		
Body parts exposed	:	Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.
Room size	:	Covers use in room size of 20 m3
Temperature	:	Covers use at ambient temperatures.
Ventilation rate	:	Covers use under typical household ventilation.

11.2.15. Control of consumer exposure: Plant protection products (PC27)

Product (article) characteristics		
Covers concentrations up to 10 %		
Physical form of product	:	High volatile liquid
Vapour pressure	:	5726 Pa
Amount used, frequency and duration of use (or from service life)		
Amount used per event	:	<= 50 g/event
For each use event, assumes swallowed amount of	:	0,3 g/event
Duration	:	Covers exposure up to 4 h
Use frequency	:	1 events per day
Conditions and measures related to personal protection, hygiene and health evaluation		
Avoid direct eye contact with product, also via contamination on hands.		
Other conditions affecting consumers exposure		
Body parts exposed	:	Assumes that potential dermal contact is limited to hands.
Room size	:	Covers use in room size of 20 m3
Temperature	:	Covers use at ambient temperatures.
Ventilation rate	:	Covers use under typical household ventilation.

11.2.16. Control of consumer exposure: Polishes and wax blends (PC31)

Product (article) characteristics		
Covers concentrations up to 50 %		
Physical form of product	:	High volatile liquid
Vapour pressure	:	5726 Pa
Amount used, frequency and duration of use (or from service life)		
Amount used per event	:	<= 50 g/event
Duration	:	Covers exposure up to 1,2 h
Use frequency	:	29 times per year
Conditions and measures related to personal protection, hygiene and health evaluation		
Avoid direct eye contact with product, also via contamination on hands.		
Other conditions affecting consumers exposure		
Body parts exposed	:	Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.
Room size	:	Covers use in room size of 20 m3
Temperature	:	Covers use at ambient temperatures.
Ventilation rate	:	Covers use under typical household ventilation.

11.2.17. Control of consumer exposure: Polishes and wax blends (PC31)

Product (article) characteristics		
Covers concentrations up to 10 %		
Physical form of product	:	High volatile liquid
Vapour pressure	:	5726 Pa
Amount used, frequency and duration of use (or from service life)		
Amount used per event	:	<= 50 g/event
Duration	:	Covers exposure up to 0,3 h
Use frequency	:	8 times per year
Conditions and measures related to personal protection, hygiene and health evaluation		
Avoid direct eye contact with product, also via contamination on hands.		
Other conditions affecting consumers exposure		

Body parts exposed	:	Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.
Room size	:	Covers use in room size of 20 m3
Temperature	:	Covers use at ambient temperatures.
Ventilation rate	:	Covers use under typical household ventilation.

11.2.18. Control of consumer exposure: Textile dyes and impregnating products (PC34)

Product (article) characteristics		
Covers concentrations up to 10 %		
Physical form of product	:	High volatile liquid
Vapour pressure	:	5726 Pa
Amount used, frequency and duration of use (or from service life)		
Amount used per event	:	<= 50 g/event
Duration	:	Covers exposure up to 1 h
Use frequency	:	1 events per day
Conditions and measures related to personal protection, hygiene and health evaluation		
Avoid direct eye contact with product, also via contamination on hands. Dilution factor assumed before use: 0.01		
Other conditions affecting consumers exposure		
Body parts exposed	:	Assumes that potential dermal contact is limited to hands.
Room size	:	Covers use in room size of 20 m3
Temperature	:	Covers use at ambient temperatures.
Ventilation rate	:	Covers use under typical household ventilation.

11.3. Exposure estimation and reference to its source

11.3.1. Environmental release and exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a)

Release route	Release rate	Release estimation method
Water	5,47 kg/day	Environmental Release Category (ERC)
Air	5,47 kg/day	Environmental Release Category

		(ERC)
Soil	0	Environmental Release Category (ERC)

Compartment	Exposure level	RCR
Freshwater	0,0297 mg/L (ECETOC TRA environment v3)	0,031
Freshwater sediment	0,114 mg/kg dry weight (ECETOC TRA environment v3)	0,032
Marine water	0,00304 mg/L (ECETOC TRA environment v3)	< 0,01
Marine sediment	0,0116 mg/kg dry weight (ECETOC TRA environment v3)	< 0,01
Agricultural soil	0,00115 mg/kg dry weight (ECETOC TRA environment v3)	< 0,01
Sewage treatment plant	0,273 mg/L (ECETOC TRA environment v3)	< 0,01
Man via environment - Oral	0,00047 mg/kg bw/day (ECETOC TRA environment v3)	< 0,01
Man via environment - Inhalation	0,00112 mg/kg bw/day (ECETOC TRA environment v3)	< 0,01

11.3.2. Environmental release and exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) (ERC8d)

Release route	Release rate	Release estimation method
Water	5,47 kg/day	Environmental Release Category (ERC)
Air	5,47 kg/day	Environmental Release Category (ERC)
Soil	0,2	Environmental Release Category (ERC)
Soil	1,09 kg/day	Environmental Release Category (ERC)

Compartment	Exposure level	RCR
Freshwater	0,0297 mg/L (ECETOC TRA environment v3)	0,031
Freshwater sediment	0,114 mg/kg dry weight (ECETOC TRA environment v3)	0,032
Marine water	0,00304 mg/L (ECETOC TRA	< 0,01

	environment v3)	
Marine sediment	0,0116 mg/kg dry weight (ECETOC TRA environment v3)	< 0,01
Agricultural soil	0,00115 mg/kg dry weight (ECETOC TRA environment v3)	< 0,01
Sewage treatment plant	0,273 mg/L (ECETOC TRA environment v3)	< 0,01
Man via environment - Oral	0,00047 mg/kg bw/day (ECETOC TRA environment v3)	< 0,01
Man via environment - Inhalation	0,00112 mg/kg bw/day (ECETOC TRA environment v3)	< 0,01

11.3.3. Consumer exposure: Adhesives, sealants (PC1)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	111 mg/m³ (ECETOC TRA consumer v3)	0,973
inhalative	systemic	short-term	111 mg/m³ (ECETOC TRA consumer v3)	0,973
dermal	systemic	long-term	3,28 mg/kg bw/day (ECETOC TRA consumer v3)	0,016

11.3.4. Consumer exposure: Adhesives, sealants (PC1)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0,778 mg/m³ (ECETOC TRA consumer v3)	< 0,01
inhalative	systemic	short-term	47,3 mg/m³ (ECETOC TRA consumer v3)	0,414
dermal	systemic	long-term	1,4 mg/kg bw/day (ECETOC TRA consumer v3)	< 0,01

11.3.5. Consumer exposure: Adhesives, sealants (PC1)

Exposure route	Health effect	Exposure	Exposure level	RCR

		indicator		
inhalative	systemic	long-term	23,5 mg/m³ (ECETOC TRA consumer v3)	0,206
inhalative	systemic	short-term	23,5 mg/m³ (ECETOC TRA consumer v3)	0,206
dermal	systemic	long-term	1,4 mg/kg bw/day (ECETOC TRA consumer v3)	< 0,01

11.3.6. Consumer exposure: Air care products (PC3)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	20,5 mg/m³ (ECETOC TRA consumer v3)	0,179
inhalative	systemic	short-term	20,5 mg/m³ (ECETOC TRA consumer v3)	0,179
dermal	systemic	long-term	19,9 mg/kg bw/day (ECETOC TRA consumer v3)	0,097

11.3.7. Consumer exposure: Air care products (PC3)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	1,41 mg/m³ (ECETOC TRA consumer v3)	0,012
inhalative	systemic	short-term	1,41 mg/m³ (ECETOC TRA consumer v3)	0,012
dermal	systemic	long-term	3,99 mg/kg bw/day (ECETOC TRA consumer v3)	0,019

11.3.8. Consumer exposure: Biocidal products (PC8)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR

inhalative	systemic	long-term	2,25 mg/m³ (ECETOC TRA consumer v3)	0,02
inhalative	systemic	short-term	2,25 mg/m³ (ECETOC TRA consumer v3)	0,02
dermal	systemic	long-term	0,0563 mg/kg bw/day (ECETOC TRA consumer v3)	< 0,01

11.3.9. Consumer exposure: Biocidal products (PC8)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0,543 mg/m³ (ECETOC TRA consumer v3)	< 0,01
inhalative	systemic	short-term	1,55 mg/m³ (ECETOC TRA consumer v3)	0,014
dermal	systemic	long-term	5,63 mg/kg bw/day (ECETOC TRA consumer v3)	< 0,01

11.3.10. Consumer exposure: Biocidal products (PC8)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	15,1 mg/m³ (ECETOC TRA consumer v3)	0,132
inhalative	systemic	short-term	15,1 mg/m³ (ECETOC TRA consumer v3)	0,132
dermal	systemic	long-term	152 mg/kg bw/day (ECETOC TRA consumer v3)	0,737

11.3.11. Consumer exposure: Ink and toners (PC18)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	86 mg/m³ (ECETOC TRA	0,754

			consumer v3)	
inhalative	systemic	short-term	86 mg/m³ (ECETOC TRA consumer v3)	0,754
dermal	systemic	long-term	4,69 mg/kg bw/day (ECETOC TRA consumer v3)	0,023

11.3.12. Consumer exposure: Leather treatment products (PC23)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	3,62 mg/m³ (ECETOC TRA consumer v3)	0,032
inhalative	systemic	short-term	45,3 mg/m³ (ECETOC TRA consumer v3)	0,397
dermal	systemic	long-term	28,2 mg/kg bw/day (ECETOC TRA consumer v3)	0,011

11.3.13. Consumer exposure: Leather treatment products (PC23)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0,136 mg/m³ (ECETOC TRA consumer v3)	< 0,01
inhalative	systemic	short-term	6,24 mg/m³ (ECETOC TRA consumer v3)	0,055
dermal	systemic	long-term	11,3 mg/kg bw/day (ECETOC TRA consumer v3)	< 0,01

11.3.14. Consumer exposure: Lubricants, greases, release products (PC24)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0,0368 mg/m³ (ECETOC TRA consumer v3)	< 0,01

inhalative	systemic	short-term	3,36 mg/m³ (ECETOC TRA consumer v3)	0,029
dermal	systemic	long-term	1,23 mg/kg bw/day (ECETOC TRA consumer v3)	< 0,01

11.3.15. Consumer exposure: Plant protection products (PC27)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	15,7 mg/m³ (ECETOC TRA consumer v3)	0,137
inhalative	systemic	short-term	15,7 mg/m³ (ECETOC TRA consumer v3)	0,137
dermal	systemic	long-term	11,2 mg/kg bw/day (ECETOC TRA consumer v3)	0,054
oral	systemic	long-term	3 mg/kg bw/day (ECETOC TRA consumer v3)	0,034

11.3.16. Consumer exposure: Polishes and wax blends (PC31)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	3,62 mg/m³ (ECETOC TRA consumer v3)	0,032
inhalative	systemic	short-term	45,3 mg/m³ (ECETOC TRA consumer v3)	0,397
dermal	systemic	long-term	28,2 mg/kg bw/day (ECETOC TRA consumer v3)	0,011

11.3.17. Consumer exposure: Polishes and wax blends (PC31)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0,0684 mg/m³ (ECETOC TRA	< 0,01

			consumer v3)	
inhalative	systemic	short-term	3,12 mg/m³ (ECETOC TRA consumer v3)	0,027
dermal	systemic	long-term	5,65 mg/kg bw/day (ECETOC TRA consumer v3)	< 0,01

11.3.18. Consumer exposure: Textile dyes and impregnating products (PC34)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	7,83 mg/m³ (ECETOC TRA consumer v3)	0,069
inhalative	systemic	short-term	7,83 mg/m³ (ECETOC TRA consumer v3)	0,069
dermal	systemic	long-term	0,112 mg/kg bw/day (ECETOC TRA consumer v3)	< 0,01

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

Not applicable

ES12: Consumer use; Heat transfer fluids (PC16).

12.1. Title section

Exposure Scenario name	:	Use in functional fluids
Structured Short Title	:	Consumer use; Heat transfer fluids (PC16).

Environment		
CS1	**Widespread use of functional fluid (outdoor)**	ERC9b
Consumer		
CS2	**Liquids**	PC16

12.2. Conditions of use affecting exposure

12.2.1. Control of environmental exposure: Widespread use of functional fluid (outdoor) (ERC9b)

Amount used, frequency and duration of use (or from service life)		
Annual amount per site	:	1000000 kg
Fraction of regional tonnage used locally	:	0,0005
Regional use tonnage	:	0,1
Emission days	:	365
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	Incineration / thermal oxidation
Waste - minimum efficiency of	:	99,98 %
Waste treatment	:	Distillation of used process solvent Landfill
Other conditions affecting environmental exposure		
Local freshwater dilution factor		
Local marine water dilution factor		

12.2.2. Control of consumer exposure: Heat transfer fluids (PC16)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	High volatile liquid
Vapour pressure	:	5726 Pa
Amount used, frequency and duration of use (or from service life)		
Amount used per event	:	<= 2200 g/event
Duration	:	Covers exposure up to 0,17 h
Use frequency	:	4 times per year
Conditions and measures related to personal protection, hygiene and health evaluation		
Avoid direct eye contact with product, also via contamination on hands.		
Other conditions affecting consumers exposure		
Body parts exposed	:	Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.
Indoor or outdoor use	:	Outdoor use
Temperature	:	Covers use at ambient temperatures.

12.3. Exposure estimation and reference to its source

12.3.1. Environmental release and exposure: Widespread use of functional fluid (outdoor) (ERC9b)

Release route	Release rate	Release estimation method
Water	0,025	ESVOC SPERC 9.13c.v1
Water	34,2 g/d	ESVOC SPERC 9.13c.v1
Air	0,05	ESVOC SPERC 9.13c.v1
Air	68,4 g/d	ESVOC SPERC 9.13c.v1
Soil	0,025	ESVOC SPERC 9.13c.v1

Compartment	Exposure level	RCR
Freshwater	0,00238 mg/L (ECETOC TRA environment v3)	< 0,01
Freshwater sediment	0,00912 mg/kg dry weight	< 0,01

	(ECETOC TRA environment v3)	
Marine water	0,000303 mg/L (ECETOC TRA environment v3)	< 0,01
Marine sediment	0,00116 mg/kg dry weight (ECETOC TRA environment v3)	< 0,01
Agricultural soil	0,00115 mg/kg dry weight (ECETOC TRA environment v3)	< 0,01
Man via environment - Oral	0,00047 mg/kg bw/day (ECETOC TRA environment v3)	< 0,01
Man via environment - Inhalation	0,00039 mg/kg bw/day (ECETOC TRA environment v3)	< 0,01

12.3.2. Consumer exposure: Heat transfer fluids (PC16)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0,0161 mg/m³ (ECETOC TRA consumer v3)	< 0,01
inhalative	systemic	short-term	1,48 mg/m³ (ECETOC TRA consumer v3)	0,013
dermal	systemic	long-term	61,5 mg/kg bw/day (ECETOC TRA consumer v3)	< 0,01

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

Not applicable

ES13: Consumer use; Various products (PC9a, PC9b, PC9c).

13.1. Title section

Exposure Scenario name	:	Use in coatings
Structured Short Title	:	Consumer use; Various products (PC9a, PC9b, PC9c).

Environment		
CS1	**Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor), Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)**	ERC8a, ERC8d
Consumer		
CS2	**Waterborne latex wall paint**	PC9a
CS3	**Solvent rich, high solid, water borne paint**	PC9a
CS4	**Aerosol spray can**	PC9a
CS5	**Removers (paint-, glue-, wall paper-, sealant-remover)**	PC9a
CS6	**Fillers and putty**	PC9b
CS7	**Plasters and floor equalizers**	PC9b
CS8	**Modelling clay**	PC9b
CS9	**Finger paints**	PC9c

13.2. Conditions of use affecting exposure

13.2.1. Control of environmental exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a) / Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) (ERC8d)

Amount used, frequency and duration of use (or from service life)		
Annual amount per site	:	1000000 kg
Fraction of EU tonnage used in region	:	0,1
Fraction of regional tonnage used locally	:	0,0005
Emission days	:	365

Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	Incineration / thermal oxidation
Waste - minimum efficiency of	:	99,98 %
Other conditions affecting environmental exposure		
Local freshwater dilution factor		
Local marine water dilution factor		

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

Product (article) characteristics		
Covers concentrations up to 1 %		
Physical form of product	:	High volatile liquid
Vapour pressure	:	5726 Pa
Amount used, frequency and duration of use (or from service life)		
Amount used per event	:	<= 2760 g/event
Duration	:	Covers exposure up to 2,2 h
Use frequency	:	4 times per year
Other conditions affecting consumers exposure		
Body parts exposed	:	Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.
Room size	:	Covers use in room size of 20 m3
Temperature	:	Covers use at ambient temperatures.
Ventilation rate	:	Covers use under typical household ventilation.

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

Product (article) characteristics		
Covers concentrations up to 10 %		
Physical form of product	:	High volatile liquid
Vapour pressure	:	5726 Pa
Amount used, frequency and duration of use (or from service life)		

Amount used per event	:	<= 744 g/event
Duration	:	Covers exposure up to 2,2 h
Use frequency	:	6 times per year
Other conditions affecting consumers exposure		
Body parts exposed	:	Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.
Room size	:	Covers use in room size of 20 m3
Temperature	:	Covers use at ambient temperatures.
Ventilation rate	:	Open doors and windows.

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

Product (article) characteristics		
Covers concentrations up to 20 %		
Physical form of product	:	High volatile liquid
Vapour pressure	:	5726 Pa
Amount used, frequency and duration of use (or from service life)		
Amount used per event	:	<= 215 g/event
Duration	:	Covers exposure up to 0,5 h
Use frequency	:	2 times per year
Other conditions affecting consumers exposure		
Body parts exposed	:	Palm of one hand 254 cm2
Room size	:	Avoid using in rooms smaller than a garage - room volume of at least 35 m3
Temperature	:	Covers use at ambient temperatures.
Ventilation rate	:	Covers use in a one car garage (>34 m3) under typical ventilation.

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

Product (article) characteristics		
Covers concentrations up to 20 %		

Physical form of product	:	High volatile liquid
Vapour pressure	:	5726 Pa
Amount used, frequency and duration of use (or from service life)		
Amount used per event	:	<= 491 g/event
Duration	:	Covers exposure up to 2,5 h
Use frequency	:	3 times per year
Other conditions affecting consumers exposure		
Body parts exposed	:	Assumes that potential dermal contact is limited to hands.
Room size	:	Covers use in room size of 20 m3
Temperature	:	Covers use at ambient temperatures.
Ventilation rate	:	Open doors and windows.

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

Product (article) characteristics		
Covers concentrations up to 2 %		
Physical form of product	:	High volatile liquid
Vapour pressure	:	5726 Pa
Amount used, frequency and duration of use (or from service life)		
Amount used per event	:	<= 85 g/event
Duration	:	Covers exposure up to 4 h
Use frequency	:	12 times per year
Other conditions affecting consumers exposure		
Body parts exposed	:	Assumes that potential dermal contact is limited to fingertips.
Room size	:	Covers use in room size of 20 m3
Temperature	:	Covers use at ambient temperatures.
Ventilation rate	:	Covers use under typical household ventilation.

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

Product (article) characteristics

Covers concentrations up to 2 %		
Physical form of product	:	High volatile liquid
Vapour pressure	:	5726 Pa
Amount used, frequency and duration of use (or from service life)		
Amount used per event	:	<= 4140 g/event
Duration	:	Covers exposure up to 2,5 h
Use frequency	:	12 times per year
Other conditions affecting consumers exposure		
Body parts exposed	:	Assumes that potential dermal contact is limited to hands.
Room size	:	Covers use in room size of 20 m3
Temperature	:	Covers use at ambient temperatures.
Ventilation rate	:	Open doors and windows.

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

Product (article) characteristics		
Covers concentrations up to 1 %		
Physical form of product	:	High volatile liquid
Vapour pressure	:	5726 Pa
Amount used, frequency and duration of use (or from service life)		
Amount used per event	:	<= 100 g/event
For each use event, assumes swallowed amount of	:	1 g/event
Duration	:	Covers exposure up to 2 h
Use frequency	:	1 events per day
Other conditions affecting consumers exposure		
Body parts exposed	:	254 cm2
Room size	:	Covers use in room size of 20 m3
Temperature	:	Covers use at ambient temperatures.
Ventilation rate	:	Covers use under typical household ventilation.

13.2.9. Control of consumer exposure: Finger paints (PC9c)

Product (article) characteristics		
Covers concentrations up to 10 %		
Physical form of product	:	High volatile liquid
Vapour pressure	:	5726 Pa
Amount used, frequency and duration of use (or from service life)		
Amount used per event	:	<= 100 g/event
For each use event, assumes swallowed amount of	:	0,2 g/event
Duration	:	Covers exposure up to 2,2 h
Use frequency	:	1 events per day
Conditions and measures related to personal protection, hygiene and health evaluation		
dermal transfer factor: 0.5		
Other conditions affecting consumers exposure		
Body parts exposed	:	Palm of one hand 254 cm2
Room size	:	Covers use in room size of 20 m3
Temperature	:	Covers use at ambient temperatures.
Ventilation rate	:	Covers use under typical household ventilation.

13.3. Exposure estimation and reference to its source

13.3.1. Environmental release and exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a) / Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) (ERC8d)

Release route	Release rate	Release estimation method
Water	0,01	ESVOC SPERC 8.3c.v1
Water	13,6 g/d	ESVOC SPERC 8.3c.v1
Air	0,985	ESVOC SPERC 8.3c.v1
Air	1,34 kg/day	ESVOC SPERC 8.3c.v1
Soil	0,005	ESVOC SPERC 8.3c.v1

Compartment	Exposure level	RCR
Freshwater	0,00236 mg/L (ECETOC TRA environment v3)	< 0,01
Freshwater sediment	0,00907 mg/kg dry weight (ECETOC TRA environment v3)	< 0,01
Marine water	0,000301 mg/L (ECETOC TRA environment v3)	< 0,01
Marine sediment	0,00115 mg/kg dry weight (ECETOC TRA environment v3)	< 0,01
Agricultural soil	0,00115 mg/kg dry weight (ECETOC TRA environment v3)	< 0,01
Sewage treatment plant	0,0000865 mg/L (ECETOC TRA environment v3)	< 0,01
Man via environment - Oral	0,00047 mg/kg bw/day (ECETOC TRA environment v3)	< 0,01
Man via environment - Inhalation	0,00039 mg/kg bw/day (ECETOC TRA environment v3)	< 0,01

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0,772 mg/m³ (ECETOC TRA consumer v3)	< 0,01
inhalative	systemic	short-term	70,2 mg/m³ (ECETOC TRA consumer v3)	0,615
dermal	systemic	long-term	0,563 mg/kg bw/day (ECETOC TRA consumer v3)	< 0,01

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0,988 mg/m³ (ECETOC TRA consumer v3)	< 0,01
inhalative	systemic	short-term	61,7 mg/m³ (ECETOC TRA consumer v3)	0,541

dermal	systemic	long-term	5,63 mg/kg bw/day (ECETOC TRA consumer v3)	< 0,01

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0,0927 mg/m³ (ECETOC TRA consumer v3)	< 0,01
inhalative	systemic	short-term	18,5 mg/m³ (ECETOC TRA consumer v3)	0,162
dermal	systemic	long-term	6,69 mg/kg bw/day (ECETOC TRA consumer v3)	< 0,01

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0,671 mg/m³ (ECETOC TRA consumer v3)	< 0,01
inhalative	systemic	short-term	81,6 mg/m³ (ECETOC TRA consumer v3)	0,715
dermal	systemic	long-term	22,5 mg/kg bw/day (ECETOC TRA consumer v3)	< 0,01

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0,176 mg/m³ (ECETOC TRA consumer v3)	< 0,01
inhalative	systemic	short-term	5,36 mg/m³ (ECETOC TRA consumer v3)	0,047
dermal	systemic	long-term	0,0939 mg/kg bw/day (ECETOC	< 0,01

			TRA consumer v3)	

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	2,26 mg/m³ (ECETOC TRA consumer v3)	0,02
inhalative	systemic	short-term	68,7 mg/m³ (ECETOC TRA consumer v3)	0,603
dermal	systemic	long-term	2,25 mg/kg bw/day (ECETOC TRA consumer v3)	< 0,01

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	2,42 mg/m³ (ECETOC TRA consumer v3)	0,021
inhalative	systemic	short-term	2,42 mg/m³ (ECETOC TRA consumer v3)	0,021
dermal	systemic	long-term	2 mg/kg bw/day (ECETOC TRA consumer v3)	< 0,01
oral	systemic	long-term	0,999 mg/kg bw/day (ECETOC TRA consumer v3)	0,011

13.3.9. Consumer exposure: Finger paints (PC9c)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	25,4 mg/m³ (ECETOC TRA consumer v3)	0,222
inhalative	systemic	short-term	25,4 mg/m³ (ECETOC TRA consumer v3)	0,222

dermal	systemic	long-term	10 mg/kg bw/day (ECETOC TRA consumer v3)	0,049
oral	systemic	long-term	2 mg/kg bw/day (ECETOC TRA consumer v3)	0,023

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

Not applicable

ES14: Consumer use; Anti-freeze and de-icing products (PC4).

14.1. Title section

Exposure Scenario name	:	Use in de-icing and anti-icing fluids
Structured Short Title	:	Consumer use; Anti-freeze and de-icing products (PC4).

Environment		
CS1	**Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)**	ERC8d
Consumer		
CS2	**Washing car window**	PC4
CS3	**Pouring into radiator**	PC4
CS4	**Lock de-icer**	PC4

14.2. Conditions of use affecting exposure

14.2.1. Control of environmental exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) (ERC8d)

Amount used, frequency and duration of use (or from service life)		
Annual amount per site	:	12000000 kg
Fraction of EU tonnage used in region	:	0,1
Fraction of regional tonnage used locally	:	0,002
Emission days	:	365
Other conditions affecting environmental exposure		
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

14.2.2. Control of consumer exposure: Anti-freeze and de-icing products (PC4)

Product (article) characteristics		
Covers concentrations up to 90 %		
Physical form of product	:	High volatile liquid
Vapour pressure	:	5726 Pa
Amount used, frequency and duration of use (or from service life)		
Amount used per event	:	<= 50 g/event
Duration	:	Covers exposure up to 1 min
Use frequency	:	1 events per day
Conditions and measures related to personal protection, hygiene and health evaluation		
Avoid direct eye contact with product, also via contamination on hands.		
Other conditions affecting consumers exposure		
Indoor or outdoor use	:	Outdoor use
Temperature	:	Covers use at ambient temperatures.

14.2.3. Control of consumer exposure: Anti-freeze and de-icing products (PC4)

Product (article) characteristics		
Covers concentrations up to 80 %		
Physical form of product	:	High volatile liquid
Vapour pressure	:	5726 Pa
Amount used, frequency and duration of use (or from service life)		
Amount used per event	:	<= 2000 g/event
Duration	:	Covers exposure up to 0,1 h
Use frequency	:	1 events per day
Conditions and measures related to personal protection, hygiene and health evaluation		
Avoid direct eye contact with product, also via contamination on hands.		
Other conditions affecting consumers exposure		
Body parts exposed	:	Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.
Room size	:	Avoid using in rooms smaller than a garage - room volume of at

		least 35 m3
Temperature	:	Covers use at ambient temperatures.
Ventilation rate	:	Covers use in a one car garage (>34 m3) under typical ventilation.

14.2.4. Control of consumer exposure: Anti-freeze and de-icing products (PC4)

Product (article) characteristics		
Covers concentrations up to 50 %		
Physical form of product	:	High volatile liquid
Vapour pressure	:	5726 Pa
Amount used, frequency and duration of use (or from service life)		
Amount used per event	:	<= 4 g/event
Duration	:	Covers exposure up to 0,25 h
Use frequency	:	1 events per day
Conditions and measures related to personal protection, hygiene and health evaluation		
Avoid direct eye contact with product, also via contamination on hands.		
Other conditions affecting consumers exposure		
Body parts exposed	:	Palm of one hand
Room size	:	Avoid using in rooms smaller than a garage - room volume of at least 35 m3
Temperature	:	Covers use at ambient temperatures.
Ventilation rate	:	Covers use in a one car garage (>34 m3) under typical ventilation.

14.3. Exposure estimation and reference to its source

14.3.1. Environmental release and exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) (ERC8d)

Release route	Release rate	Release estimation method
Water	0,05	ESVOC SPERC 8.14b.v1
Water	3,28 kg/day	ESVOC SPERC 8.14b.v1
Air	0,9	ESVOC SPERC 8.14b.v1

Air	59,1 kg/day	ESVOC SPERC 8.14b.v1
Soil	0,05	ESVOC SPERC 8.14b.v1

Compartment	Exposure level	RCR
Freshwater	0,00443 mg/L (ECETOC TRA environment v3)	< 0,01
Freshwater sediment	0,0172 mg/kg dry weight (ECETOC TRA environment v3)	< 0,01
Marine water	0,000508 mg/L (ECETOC TRA environment v3)	< 0,01
Marine sediment	0,00194 mg/kg dry weight (ECETOC TRA environment v3)	< 0,01
Agricultural soil	0,00123 mg/kg dry weight (ECETOC TRA environment v3)	< 0,01
Man via environment - Oral	0,00047 mg/kg bw/day (ECETOC TRA environment v3)	< 0,01
Man via environment - Inhalation	0,000399 mg/kg bw/day (ECETOC TRA environment v3)	< 0,01

14.3.2. Consumer exposure: Anti-freeze and de-icing products (PC4)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0,317 mg/m³ (ECETOC TRA consumer v3)	< 0,01
inhalative	systemic	short-term	0,317 mg/m³ (ECETOC TRA consumer v3)	< 0,01

14.3.3. Consumer exposure: Anti-freeze and de-icing products (PC4)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	3,06 mg/m³ (ECETOC TRA consumer v3)	0,027
inhalative	systemic	short-term	3,06 mg/m³ (ECETOC TRA consumer v3)	0,027
dermal	systemic	long-term	45 mg/kg bw/day (ECETOC TRA	0,218

			consumer v3)	

14.3.4. Consumer exposure: Anti-freeze and de-icing products (PC4)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0,51 mg/m³ (ECETOC TRA consumer v3)	< 0,01
inhalative	systemic	short-term	0,51 mg/m³ (ECETOC TRA consumer v3)	< 0,01
dermal	systemic	long-term	14 mg/kg bw/day (ECETOC TRA consumer v3)	0,07

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

Not applicable

ES15: Consumer use; Washing and cleaning products (PC35).

15.1. Title section

Exposure Scenario name	:	Use in cleaning agents
Structured Short Title	:	Consumer use; Washing and cleaning products (PC35).

Environment		
CS1	**Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor), Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)**	ERC8a, ERC8d
Consumer		
CS2	**Laundry and dish washing products**	PC35
CS3	**Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)**	PC35
CS4	**Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)**	PC35

15.2. Conditions of use affecting exposure

15.2.1. Control of environmental exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a) / Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) (ERC8d)

Amount used, frequency and duration of use (or from service life)		
Annual amount per site	:	4000000 kg
Fraction of EU tonnage used in region	:	0,1
Fraction of regional tonnage used locally	:	0,0005
Emission days	:	365
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	Incineration / thermal oxidation
Waste - minimum efficiency of	:	99,98 %
Waste treatment	:	Landfill

Other conditions affecting environmental exposure
Local freshwater dilution factor
Local marine water dilution factor

15.2.2. Control of consumer exposure: Washing and cleaning products (PC35)

Product (article) characteristics		
Covers concentrations up to 5 %		
Physical form of product	:	High volatile liquid
Vapour pressure	:	5726 Pa
Amount used, frequency and duration of use (or from service life)		
Amount used per event	:	<= 15 g/event
Duration	:	Covers exposure up to 0,5 h
Use frequency	:	1 events per day
Conditions and measures related to personal protection, hygiene and health evaluation		
Dilution factor assumed before use: 0.01		
Other conditions affecting consumers exposure		
Body parts exposed	:	Assumes that potential dermal contact is limited to hands.
Room size	:	Covers use in room size of 20 m3
Temperature	:	Covers use at ambient temperatures.
Ventilation rate	:	Covers use under typical household ventilation.

15.2.3. Control of consumer exposure: Washing and cleaning products (PC35)

Product (article) characteristics		
Covers concentrations up to 5 %		
Physical form of product	:	High volatile liquid
Vapour pressure	:	5726 Pa
Amount used, frequency and duration of use (or from service life)		
Amount used per event	:	<= 27 g/event
Duration	:	Covers exposure up to 0,33 h

Use frequency	:	125 times per year
Other conditions affecting consumers exposure		
Body parts exposed	:	Assumes that potential dermal contact is limited to hands.
Room size	:	Covers use in room size of 20 m3
Temperature	:	Covers use at ambient temperatures.
Ventilation rate	:	Covers use under typical household ventilation.

15.2.4. Control of consumer exposure: Washing and cleaning products (PC35)

Product (article) characteristics		
Covers concentrations up to 15 %		
Physical form of product	:	High volatile liquid
Vapour pressure	:	5726 Pa
Amount used, frequency and duration of use (or from service life)		
Amount used per event	:	<= 35 g/event
Duration	:	Covers exposure up to 0,17 h
Use frequency	:	125 times per year
Other conditions affecting consumers exposure		
Body parts exposed	:	Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.
Room size	:	Covers use in room size of 20 m3
Temperature	:	Covers use at ambient temperatures.
Ventilation rate	:	Covers use under typical household ventilation.

15.3. Exposure estimation and reference to its source

15.3.1. Environmental release and exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a) / Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) (ERC8d)

Release route	Release rate	Release estimation method
Water	0,025	ESVOC SPERC 8.4c.v1
Water	136 g/d	ESVOC SPERC 8.4c.v1

Air	0,95	ESVOC SPERC 8.4c.v1
Air	5,2 kg/day	ESVOC SPERC 8.4c.v1
Soil	0,025	ESVOC SPERC 8.4c.v1

Compartment	Exposure level	RCR
Freshwater	0,00244 mg/L (ECETOC TRA environment v3)	< 0,01
Freshwater sediment	0,00937 mg/kg dry weight (ECETOC TRA environment v3)	< 0,01
Marine water	0,000309 mg/L (ECETOC TRA environment v3)	< 0,01
Marine sediment	0,00118 mg/kg dry weight (ECETOC TRA environment v3)	< 0,01
Agricultural soil	0,00115 mg/kg dry weight (ECETOC TRA environment v3)	< 0,01
Sewage treatment plant	0,000865 mg/L (ECETOC TRA environment v3)	< 0,01
Man via environment - Oral	0,00047 mg/kg bw/day (ECETOC TRA environment v3)	< 0,01
Man via environment - Inhalation	0,000391 mg/kg bw/day (ECETOC TRA environment v3)	< 0,01

15.3.2. Consumer exposure: Washing and cleaning products (PC35)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0,672 mg/m³ (ECETOC TRA consumer v3)	< 0,01
inhalative	systemic	short-term	0,672 mg/m³ (ECETOC TRA consumer v3)	< 0,01
dermal	systemic	long-term	0,0563 mg/kg bw/day (ECETOC TRA consumer v3)	< 0,01

15.3.3. Consumer exposure: Washing and cleaning products (PC35)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0,294 mg/m³ (ECETOC TRA	< 0,01

			consumer v3)	
inhalative	systemic	short-term	0,841 mg/m³ (ECETOC TRA consumer v3)	< 0,01
dermal	systemic	long-term	5,63 mg/kg bw/day (ECETOC TRA consumer v3)	< 0,01

15.3.4. Consumer exposure: Washing and cleaning products (PC35)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0,619 mg/m³ (ECETOC TRA consumer v3)	< 0,01
inhalative	systemic	short-term	1,77 mg/m³ (ECETOC TRA consumer v3)	0,02
dermal	systemic	long-term	8,43 mg/kg bw/day (ECETOC TRA consumer v3)	0,01

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

Not applicable

ES16: Consumer use; Various products (PC28, PC39).

16.1. Title section

Exposure Scenario name	:	Other, Consumer use
Structured Short Title	:	Consumer use; Various products (PC28, PC39).

Environment		
CS1	**Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)**	ERC8a
Consumer		
CS2	**Various products**	PC28, PC39

16.2. Conditions of use affecting exposure

16.2.1. Control of environmental exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a)

Amount used, frequency and duration of use (or from service life)		
Annual amount per site	:	20000000 kg
Fraction of EU tonnage used in region	:	0,1
Fraction of regional tonnage used locally	:	0,0005
Emission days	:	365

16.2.2. Control of consumer exposure: Perfumes, fragrances (PC28) / Cosmetics, personal care products (PC39)

Product (article) characteristics		
Physical form of product	:	High volatile liquid
Vapour pressure	:	5726 Pa

16.3. Exposure estimation and reference to its source

16.3.1. Environmental release and exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a)

Release route	Release rate	Release estimation method
Water	0	COLIPA SPERC 8a.1.b.v1
Air	27,3 kg/day	COLIPA SPERC 8a.1.b.v1
Soil	0	COLIPA SPERC 8a.1.b.v1

Compartment	Exposure level	RCR
Freshwater	0,00236 mg/L (ECETOC TRA environment v3)	< 0,01
Freshwater sediment	0,00904 mg/kg dry weight (ECETOC TRA environment v3)	< 0,01
Marine water	0,000301 mg/L (ECETOC TRA environment v3)	< 0,01
Marine sediment	0,00115 mg/kg dry weight (ECETOC TRA environment v3)	< 0,01
Agricultural soil	0,00115 mg/kg dry weight (ECETOC TRA environment v3)	< 0,01
Man via environment - Oral	0,00047 mg/kg bw/day (ECETOC TRA environment v3)	< 0,01
Man via environment - Inhalation	0,00039 mg/kg bw/day (ECETOC TRA environment v3)	< 0,01

16.3.2. Consumer exposure: Perfumes, fragrances (PC28) / Cosmetics, personal care products (PC39)

Additional information on exposure estimation
In accordance to the Article 14 (5b) of the REACh Regulation (EC) No 1907/2006, exposure estimation and risk characterisation for human health does not need to be performed for end uses in cosmetic products within the scope of Directive 76/768/EEC.

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

Not applicable