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

1.1. Product identifier

Name of product	Octalactone gamma Prod-Nr 20060 / 20860
Name of substance	Octan-4-olide
EC No	203-208-1
CAS No	104-50-7

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

Identified uses

Product categories [PC]
PC28 - Perfumes, fragrances
PC3 - Air care products
PC31 - Polishes and wax blends
PC35 - Washing and cleaning products (including solvent based products)
PC39 - Cosmetics, personal care products
PC8 - Biocidal products (e.g. Disinfectants, pest control)

Process categories [PROC]
PROC1 - Use in closed process, no likelihood of exposure
PROC2 - Use in closed, continuous process with occasional controlled exposure
PROC3 - Use in closed batch process (synthesis or formulation)
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)
PROC7 - Industrial spraying
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC14 - production of preparations or articles by tabletting, compression, extrusion, pelettisation
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC10 - Roller application or brushing
PROC11 - Non industrial spraying
PROC13 - Treatment of articles by dipping and pouring
PROC15 - Use as laboratory reagent

Environmental release categories [ERC]
ERC8a - Wide dispersive indoor use of processing aids in open systems
ERC8d - Wide dispersive outdoor use of processing aids in open systems
ERC2 - Formulation of preparations (mixtures)
ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

1.3. Details of the supplier of the safety data sheet

Manufacturer/distributor

A.C.S. International GmbH
Im Wesertal 5, D-37671 Höxter - Stahle
Phone +49 (0)5531 9906142, Fax +49 (0)5531 9906 196
E-Mail regulatory@acsint.com
Internet www.acsint.com

Advice GIZ-Nord, Göttingen, Germany

1.4. Emergency telephone number

Emergency advice

Phone +49 551 19240

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 [CLP/GHS]

Hazard classes and Hazard categories	Hazard Statements	Classification procedure
Skin Irrit. 2	**H315**	
Skin Sens. 1	**H317**	
Aquatic Chronic 3	**H412**	

Hazard statements for health hazards

H315 **Causes skin irritation.**
H317 **May cause an allergic skin reaction.**

Hazard statements for environmental hazards

H412 **Harmful to aquatic life with long lasting effects.**

2.2. Label elements

Labelling according to Regulation (EC) No 1272/2008 [CLP/GHS]

GHS07

Signal word

Warning

Hazard statements for health hazards

H315 **Causes skin irritation.**
H317 **May cause an allergic skin reaction.**

Hazard statements for environmental hazards

H412 **Harmful to aquatic life with long lasting effects.**

Precautionary Statements

Prevention

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P264 Wash hands thoroughly after handling.
P272 Contaminated work clothing should not be allowed out of the workplace.
P273 Avoid release to the environment.
P280 Wear protective gloves/protective clothing/eye protection/face protection.

Response

P302 + P352 IF ON SKIN: Wash with plenty of water.
P333 + P313 If skin irritation or rash occurs: Get medical advice/attention.
P362 + P364 Take off contaminated clothing and wash it before reuse.

Disposal
P501 Inhalt/Behälter den lokalen Regelungen zuführen.

2.3. Other hazards
No information available.

SECTION 3: Composition/ information on ingredients

3.1. Substances
CAS No 104-50-7 **Octan-4-olide**
EC No 203-208-1

3.2. Mixtures
not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures
General information
Remove contaminated soaked clothing immediately.

In case of inhalation
In case of inhalation remove the casualty into fresh air and seek medical advice.

In case of skin contact
In case of contact with skin wash off immediately with soap and water.
Remove contaminated clothing immediately, even underwear and shoes.
Seek medical advice immediately.

In case of eye contact
In case of contact with eyes rinse with plenty of water carefully. In the event of persistent symptoms seek medical treatment.

In case of ingestion
Turn a vomiting person lying on his back onto his side.
Do not induce vomiting.
Rinse out mouth thoroughly with water.

4.2. Most important symptoms and effects, both acute and delayed
No information available.

4.3. Indication of any immediate medical attention and special treatment needed
No information available.

SECTION 5: Firefighting measures

5.1. Extinguishing media
Suitable extinguishing media
Foam
Dry fire-extinguishing substance
Carbon dioxide

Unsuitable extinguishing media
Full water jet

5.2. Special hazards arising from the substance or mixture
Carbon monoxide (CO)
Carbon dioxide (CO2)

5.3. Advice for firefighters
Special protective equipment for fire-fighters
Use breathing apparatus with independent air supply.
Do not inhale explosion and/or combustion gases.

Additional information
Cool endangered containers with water spray jet.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
For non-emergency personnel
Ensure adequate ventilation.
Remove persons to safety.
Use personal protective clothing.
Keep away sources of ignition.

6.2. Environmental precautions
Do not discharge into the drains/surface waters/groundwater.

6.3. Methods and material for containment and cleaning up
Take up with absorbent material (e.g. sand, sawdust, general-purpose binder).
After taking up the material dispose according to regulation.

6.4. Reference to other sections
No information available.

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Advice on safe handling
Care for thoroughly room ventilation, if necessary use in well ventilated area with local exhaust ventilation at workplace.
Take the usual precautions when handling with chemicals.

General protective measures
Avoid contact with eyes and skin
Do not inhale gases/vapours/aerosols.

Hygiene measures
At work do not eat, drink and smoke.
Remove soaked clothing immediately.
Wash hands before breaks and after work.

Advice on protection against fire and explosion
Keep away from sources of ignition - No smoking

7.2. Conditions for safe storage, including any incompatibilities
Advice on storage compatibility
Do not store together with oxidizing agents.

Further information on storage conditions
Keep container tightly closed.
Protect from heat and direct solar radiation.
Store at cool and aired place.

7.3. Specific end use(s)
No information available.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters
Additional advice
not determined

8.2. Exposure controls
Respiratory protection
In case of insufficient ventilation or long-term effect use breathing apparatus.

Hand protection
chemical-resistant gloves

Eye protection
safety goggles with side protection

Other protection measures
Light protective clothing.

Limitation and surveillance of the environment
not determined

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	**Colour**	**Odour**
liquid	colorless to pale yellow	coconut

Odour threshold
not determined

Important health, safety and environmental information

	Value	Temperature	at	Method	Remark
pH value	not determined				
Acid number	< 5 mgKOH/g				
boiling point	234 °C				
melting point				not determined	

	Value	Temperature	at	Method	Remark
Flash point	> 100 °C			closed cup	
Vapourisation rate	not determined				
Flammable (solid)	not determined				
Flammability (gas)	not determined				
Ignition temperature	not determined				
Self ignition temperature	not determined				
Lower explosion limit	not determined				
Upper explosion limit	not determined				
Vapour pressure	not determined				
Relative density	0,97 - 0,98 g/cm3	25 °C			
Vapour density	not determined				
Solubility in water					insoluble
Solubility/other	not determined				
Partition coefficient n-octanol/water (log P O/W)	not determined				
Decomposition temperature	not determined				
Viscosity	not determined				

Oxidising properties
No information available.

Explosive properties
No information available.

9.2. Other information
No information available.

SECTION 10: Stability and reactivity

10.1. Reactivity
No information available.

10.2. Chemical stability
No information available.

10.3. Possibility of hazardous reactions
No information available.

10.4. Conditions to avoid
Evolution of heat.

10.5. Incompatible materials
Substances to avoid
Reactions with strong acids and alkalies.
Reactions with strong oxidising agents.

10.6. Hazardous decomposition products
Carbon monoxide and carbon dioxide.

Thermal decomposition

Remark Stable at ambient temperature.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity/Irritation/Sensitization

	Value/Validation	Species	Method	Remark
LD50 acute oral	> 2000 mg/kg	rat		
LD50 acute dermal	> 2000 mg/kg	rabbit		
Skin irritation	Causes skin irritation.	human		
Eye irritation			not determined	
Skin sensitization	May cause an allergic skin reaction.	human		

SECTION 12: Ecological information

12.1. Toxicity

Ecotoxicological effects

	Value	Species	Method	Validation
Fish	LC50 > 3,125 mg/l (96 h)			
Daphnia	EC50 3,176 mg/l (48 h)	Daphnia magna		
Algae	EC50 13,06 mg/l (72 h)			

12.2. Persistence and degradability

No information available.

12.3. Bioaccumulative potential
No information available.

12.4. Mobility in soil
No information available.

12.5. Results of PBT and vPvB assessment
No information available.

12.6. Other adverse effects
No information available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods
Recommendations for the product
Remove in accordance with local official regulations.

Recommendations for packaging
Contaminated packaging should be emptied as far as possible and after appropriate cleansing may be taken fot reuse.
Packaging that cannot be cleaned should be disposed of like the product.

SECTION 14: Transport information

	ADR/RID	IMDG	IATA-DGR
14.1. UN number	-	-	-
14.2. UN proper shipping name	-	-	-
14.3. Transport hazard class(es)	-	-	-
14.4. Packing group	-	-	-
14.5. Environmental hazards	-	-	-

14.6. Special precautions for user
No information available.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
No information available.

Land and inland navigation transport ADR/RID
Not classified.

Transport/further information
No dangerous goods as defined by the transport regulations - ADR/RID, IMDG, ICAO/IATA-DGR.

SECTION 15: Regulatory information

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

National regulations

Water hazard class	1	value from literature
Decree for case of interference/remarks	no	

15.2. Chemical Safety Assessment

No information available.

SECTION 16: Other information

Training advice
no

Recommended uses and restrictions
National and local regulations concerning chemicals shall be observed.

Further information
The information contained herein is based on the state of our knowledge. It characterizes the product with regard to the appropriate safety precautions. It does not represent a guarantee of the properties of the product.

Indication of changes: "!" = Data changed compared with the previous version. Previous version: 2.3

Sources of key data used
Listed in EINECS and TSCA

Extended Safety Data Sheet

According to Regulation (EC) No 1907/2006, Annex II,

Amended by COMMISSION REGULATION (EU) 2015/830,

According to REGULATION (EC) No 1272/2008

Octan-4-olide

Version 2.0

Issue date: 15-01-2019

Revision date: 15-01-2019 **eSDS Record Number: CSSS-TCO-010-130047**

Section 1 Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier:

Identification on the label/Trade name:	Octan-4-olide
Additional identification:	5-butyldihydrofuran-2(3H)-one
Identification of the product:	CAS# 104-50-7 EC# 203-208-1
Index Number:	N/A
REACH registration No.:	01-2120793635-41-0000

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

1.2.1 Identified uses:

F-1: Formulation of fragrance compounds

F-2: Formulation of fragranced end-products

IW-1: Industrial end-use of washing and cleaning products

PW-1: Professional use of polishes and wax blends

PW-2: Professional end-use of washing and cleaning products

C-1: Consumer (and Professional) end-use of cosmetics

C-2: Consumer end-use of polishes and wax blends

C-3: Consumer end-use of air care products

C-4: Consumer end-use of washing and cleaning products

C-5: Consumer end-use of biocides

1.2.2 Uses advised against:

No uses advised against are identified.

1.3 Details of the supplier of the safety data sheet:

Supplier(Only representative):	Chemical Inspection & Regulation Service Limited
Supplier(Manufacturer):	Anhui Hyea Aromas Co., Ltd.
Address:	PENGLING INDUSTRIAL AREA, QIANSHAN COUNTY ANHUI PROVINCE, CHINA
Contact person(E-mail):	sales@hyeachemical.com
Telephone:	+86-556-8968843; +86-21-52902282
Fax:	+86-556-8928588; +86-556-8977997

1.4 Emergency telephone Number:

+353 (1) 477 3710 (Only available during office hours (9:00a.m.-17:30p.m. Beijing Time Zone)

+86-556-8968843

Available outside office hours?	YES		NO	X

Section 2 Hazards Identification

2.1 Classification of the substance or mixture:

2.1.1 Classification:

The substance is classified as following according to REGULATION (EC) No 1272/2008:

REGULATION (EC) No 1272/2008	
Hazard classes/Hazard categories	Hazard statement
Skin Irrit. 2	H315
Skin Sens. 1	H317

For full text of H- phrases: see section 2.2.

2.2 label elements:

Hazard Pictograms:

Signal Word(S): Warning

Hazard Statement:
H315: Causes skin irritation
H317: May cause an allergic skin reaction.

Precautionary statement:
P261: Avoid breathing dust/fume/gas/mist/vapours/spray.
P264: Wash hands thoroughly after handling.
P272: Contaminated work clothing should not be allowed out of the workplace.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P302+P352: IF ON SKIN: Wash with plenty of soap and water.
P321: Specific treatment (see … on this label).
P332+P313: If skin irritation occurs: Get medical advice/attention.
P333+P313: If skin irritation or rash occurs: Get medical advice/attention.
P362+P364: Take off contaminated clothing and wash it before reuse.

2.3 Other hazards:

The substance is not considered a PBT/vPvB.

Section 3 Composition/information on ingredients

Substance/Mixture: Substance

Ingredient(s):

Chemical Name	**Registration No.**	**CAS No.**	**EC No.**	**Concentration**
Octan-4-olide	01-2120793635-41-0000	104-50-7	203-208-1	99.29 % (w/w)

Section 4 First aid measures

4.1 Description of first aid measures:

Remove contaminated clothing immediately, to be disposed of or washed before re-use. As in all cases of potential poisoning, Obtain medical advice immediately.

4.1.1 In case of inhalation:

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical advice/attention if you feel unwell.

4.1.2 In case of skin contact:

Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Wash contaminated clothing before reuse. If skin irritation persists, call a physician.

4.1.3 In case of eyes contact:

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

4.1.4 In case of ingestion:

Rinse mouth. IF SWALLOWED: Immediately call a POISON CENTER or doctor. Never give anything by mouth to an unconscious person.

4.2 Most important symptoms and effects, both acute and delayed:

Symptoms: The most important known symptoms and effects are described in the labelling (see section 2) and/or in section 11. Further symptoms are possible.

4.3 Indication of any immediate medical attention and special treatment needed:

Treatment: Treat according to symptoms (decontamination, vital functions), no known specific antidote.

If skin irritation or rash occurs, get medical advice/attention.

Section 5 Firefighting measures

5.1 Extinguishing media:

Suitable extinguishing media:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable extinguishing media:	Not available.

5.2 Special hazards arising from the substance or mixture

In case of fire, the following can be released: carbon monoxide, carbon dioxide.

5.3 Advice for firefighters:

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6 Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures:

6.1.1 For non-emergency personnel:	Evacuate personnel to safe areas. Ensure adequate ventilation, especially in confined areas. Remove all sources of ignition. Avoid contact with skin, eyes and inhalation of vapors. Use personal protection recommended in Section 8. Keep unnecessary people away; isolate hazard area and deny entry. Consider need for evacuation. Stay up wind and keep out of low areas where vapour may accumulate and ignite.
6.1.2 For emergency responders:	Wear suitable protective equipment. Apply the same recommendations as above.

6.2 Environmental Precautions:

Prevent further leakage or spillage if safe to do so. Prevent entry into waterways, sewers, basements or confined areas. Local authorities should be advised if significant spillages cannot be contained. See Section 12 for additional Ecological Information.

6.3 Methods and material for Containment and Cleaning up:

Contain and collect spillage 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).

6.4 Reference to other sections:

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.

See Section 13 for information on disposal.

Section 7 Handling and storage

7.1 Precautions for safe handling:

7.1.1 Protective measures: Handle in accordance with good industrial hygiene and safety practice. Ensure adequate ventilation, especially in confined areas. Avoid contact with skin, eyes or clothing. Wash contaminated clothing before reuse. Take precautionary measures against static discharges. Use personal protection recommended in Section 8.

7.1.2 Advice on general occupational hygiene: Good personal washing routines should be followed. Wash hands before breaks and immediately after handling the product. When using do not eat, drink or smoke. Remove contaminated clothing and protective equipment before entering eating areas.

7.2 Conditions for safe storage, including any incompatibilities: Keep container tightly closed in a dry and well-ventilated place. Keep locked up and out of reach of children. Keep away from food, drink and animal feeding stuffs. Protect from direct sunlight. Keep away from clothing as well as other incompatible materials. Keep in properly labeled containers.

7.3 Specific end use(s): Not applicable.

Section 8 Exposure Controls/Personal Protection

8.1 Control parameters:

8.1.1 Occupational exposure limits: Not available.

8.1.2 Additional exposure limits under the conditions of use: Not available.

8.1.3 DNEL/DMEL and PNEC-Values:

Workers - Hazard via inhalation route	Systemic effects-Long term exposure	DNEL=8.82 mg/m³
Workers - Hazard via dermal route	Systemic effects-Long term exposure	DNEL=2.5 mg/kg bw/day
General Population - Hazard via inhalation route	Systemic effects-Long term exposure	DNEL=2.17 mg/m³
General Population - Hazard via dermal route	Systemic effects-Long term exposure	DNEL=1.25 mg/kg bw/day
General Population - Hazard via oral route	Systemic effects-Long term exposure	DNEL=1.25 mg/kg bw/day
Hazard for aquatic organisms	Freshwater	PNEC=0.003 mg/L
Hazard for aquatic organisms	Marine water	PNEC=0 mg/L
Hazard for aquatic organisms	STP	No hazard identified
Hazard for aquatic organisms	Sediment (freshwater)	PNEC=0.09 mg/kg sediment dw
Hazard for aquatic organisms	Sediment (marine water)	PNEC=0.009 mg/kg sediment dw
Hazard for terrestrial organisms	Soil	PNEC=0.07 mg/kg soil dw
Hazard for predators	Secondary poisoning	No data available: testing technically not feasible

8.2 Exposure controls:

8.2.1Appropriate engineering controls: Handle in accordance with good industrial hygiene and safety practice. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

8.2.2 Individual protection measures, such as personal protective equipment:

Eye/face protection: Wear safety glasses with side shields (or goggles).

Hand protection: Chemical resistant gloves (also consider your own risk assessment; e.g. breakthrough times, rates of diffusion and degradation, tasks undertaken).

Body protection: Wear suitable protective clothing.

Respiratory protection: In case of insufficient ventilation, wear suitable respiratory equipment.

Thermal hazards: Wear suitable protective clothing to prevent heat.

8.2.3 Environmental exposure controls: Avoid discharge into the environment. According to local regulations, Federal and official regulations.

Section 9 Physical and chemical properties

9.1 Information on basic physical and chemical properties:

Appearance:	Clear Liquid
Colour:	Colorless - Almost colorless
Odour:	Characteristic.
Odour threshold:	Not available
pH:	Not available
Melting point/range (°C):	Not available
Boiling point/range (°C):	248.8 °C at 101.3 kPa
Flash point (°C):	115 °C at 1013 hPa
Evaporation rate:	Not available
Flammability limit - lower (%):	Not available
Flammability:	Non flammable
Ignition temperature (°C):	Not available
Upper/lower explosive limits:	Not available
Vapour pressure:	0.1 kPa at 20 °C
Vapour density:	Not available
Relative Density:	0.979 at 20 °C
Bulk density (kg/m^3):	Not available
Water solubility (g/l):	5.6 g/L at 20 °C
n-Octanol/Water (log Po/w):	Log Kow (Log Pow): 1.5 at 20 °C
Auto-ignition temperature:	365 °C at 1013 hPa
Decomposition temperature:	Not available
Viscosity, dynamic (mPa.s):	Not available
Explosive properties:	Non explosive
Oxidising properties:	Oxidising: no
Molecular Formula:	C8H14O2
Molecular Weight:	142.198

9.2. Other information:

Fat solubility(solvent-oil to be specified) etc:	Not available
Surface tension:	Not available
Dissociation constant in water(pKa):	Not available
Oxidation-reduction Potential:	Not available

Section 10 Stability and reactivity

10.1 Reactivity:	The substance is stable under normal storage and handling conditions.
10.2 Chemical stability:	Stable at room temperature in closed containers under normal storage and handling conditions.
10.3 Possibility of hazardous reactions:	No dangerous reaction known under conditions of standard use.
10.4 Conditions to avoid:	Incompatible materials. Sources of ignition, heat, flames and sparks.
10.5 Incompatible materials:	Strong acids, Strong bases, Strong oxidizing agents.
10.6 Hazardous decomposition products:	Carbon monoxide, carbon dioxide.

Section 11 Toxicological information

11.1 Information on toxicological effects:

Acute toxicity:	
LD50(Oral, Rat):	>2000 mg/kg bw
LD50(Dermal, Rabbit):	>2000 mg/kg bw
LC100(Inhalation, Rat):	Not available
Skin corrosion/Irritation:	Causes skin irritation.
Serious eye damage/irritation:	Not classified
Respiratory or skin sensitization:	May cause an allergic skin reaction.
Germ cell mutagenicity:	Not classified
Carcinogenicity:	Not classified
Reproductive toxicity:	Not classified
STOT- single exposure:	Not classified
STOT-repeated exposure:	Not classified
Aspiration hazard:	Not classified

Section 12 Ecological information

12.1 Toxicity:

Acute (short-term) toxicity:	
LC50(96h, Fish):	>3.125 mg/L
EC50(48h, Daphnia magna):	3.176 mg/L
EC50(72h, Algae/aquatic plants):	13.06 mg/L
Chronic (long-term) toxicity:	
NOEC(Fish):	Not available
NOEC(Daphnia magna):	Not available
NOEC(Algae/aquatic plants):	Not available
12.2 Persistence and degradability:	Readily biodegradable.
12.3 Bioaccumulative potential:	Low potential for bioaccumulation.
12.4 Mobility in soil:	Koc at 20°C: 1349
12.5 Results of PBT and vPvB assessment:	The substance is not considered a PBT/vPvB.
12.6 Other adverse effects:	Not available

Section 13 Disposal considerations

13.1 Waste treatment methods: Dispose of in accordance with all applicable local and national regulations. Use recovery/recycling where feasible, otherwise incineration is the recommended method of disposal. Empty containers may contain hazardous residues. Do not cut, puncture or weld on or near to the container. Labels should not be removed from containers until they have been cleaned. Contaminated containers must not be treated as household waste. Containers should be cleaned by appropriate methods and then re-used or disposed of by landfill or incineration as appropriate. Do not incinerate closed containers.

Section 14 Transport information

	Land transport (ADR/RID)	Inland waterways (ADN)	Sea transport (IMDG)	Air transport (ICAO/IATA)
UN number	Not regulated	Not regulated	Not regulated	Not regulated
UN Proper shipping name	Not regulated	Not regulated	Not regulated	Not regulated
Transport hazard Class(es)	Not regulated	Not regulated	Not regulated	Not regulated
Packing group	Not regulated	Not regulated	Not regulated	Not regulated
Environmental hazards	No	No	No	No
Special precautions for user	See section 2.2	See section 2.2	See section 2.2	See section 2.2
Transport in bulk according to Annex II of Marpol and the IBC Code	Not regulated	Not regulated	Not regulated	Not regulated

Section 15 Regulatory information

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

Relevant information regarding authorization: Not applicable.

Relevant information regarding restriction: Not applicable.

Other EU regulations: Employment restrictions concerning young person must be observed. For use only by technically qualified individuals.

Other National regulations: Not applicable

15.2 Chemical safety assessment YES [X] NO [ ]

Section 16 Other information

16.1 Indication of changes:

Version 1.0 Amended by (EU) 2015/830

Version 2.0 Exposure scenarios are placed after section 16.

16.2 Abbreviations and acronyms:

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

RID: Regulation for rail International transportation of Dangerous goods

ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways

IMDG: Code international maritime dangerous goods code

ICAO: International Civil Aviation Organization

IATA: International Air Transport Association

LC50: median lethal concentration

EC50: The effective concentration of substance that causes 50% of the maximum response.

NOEC: No Observed Effect Concentration

DNEL: derived no-effect level

PNEC: predicted no-effect concentration

16.3 Key literature references and sources for data

ECHA Registered substances data

16.4 Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 [CLP]

Classification according to Regulation (EC) No. 1272/2008		Classification procedure
Skin Irrit. 2	H315	On basis of test data
Skin Sens. 1	H317	On basis of test data

16.5 Relevant H-statements (number and full text):

H315: Causes skin irritation

H317: May cause an allergic skin reaction.

16.6 Training instructions:

Not applicable.

16.7 Further information:

This information is based upon the present state of our knowledge. This SDS has been compiled and is solely intended for this product.

16.8 Notice to reader:

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgment of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Author: Hangzhou REACH Technology Group Co., Ltd. Website:www.cirs-group.com Tel:0571-87206555 Email:info@cirs-group.com

The exposure scenario section is extracted from the CSR.

9. EXPOSURE ASSESSMENT (and related risk characterisation)

The sections 9 and 10 of this CSR have been generated with Chesar 3.3.

9.0. Introduction

9.0.1. Overview on uses

See the description of the various uses in section 2 of the CSR.

9.0.2. Assessment entity groups

Not applicable

9.0.3. Introduction to the assessment for the environment

9.0.3.1. Tonnage

Assessed tonnage: 30 tonnes/year based on:

- 30 tonnes/year imported

The following table provides the tonnage per use and the local tonnages used in the assessment for each environmental contributing activity. The local tonnage corresponds to a tonnage at the site for uses taking place at industrial sites and to a tonnage assumed for a town of 10 000 inhabitants for widespread uses.

Table 9.1. Tonnage for assessment

ES#	Exposure scenario (ES) name and related environmental contributing scenarios	Tonnage per use (t/year)	Daily local tonnage (t/day)	Annual local tonnage (t/year)
ES1 (F)	Formulation of fragrance compounds	1		
	- ERC 2: Formulation into mixture (ERC 2)		0.1	1
ES2 (F)	Formulation of fragranced end-products	1		
	- ERC 2: Formulation into mixture (ERC 2)		0.1	1
ES3 (IS)	Industrial end-use of washing and cleaning products	1		
	- ERC 4: Use of non-reactive processing aid at industrial site (no inclusion into or onto article) (ERC 4)		0.05	1
ES4 (PW)	Professional use of polishes and wax blends	1		
	- ERC 8a: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC 8a)		5.5E-7	-
ES5 (PW)	Professional end-use of washing and cleaning products	1		
	- ERC 8a: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC 8a)		5.5E-7	-
ES6 (C)	Consumer (and Professional) end-use of cosmetics	5		
	- ERC 8a: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC 8a)		2.75E-6	-
ES7 (C)	Consumer end-use of polishes and wax blends	5		
	- ERC 8a: Widespread use of non-reactive processing aid (no inclusion into or onto article,		2.75E-6	-

ES#	Exposure scenario (ES) name and related environmental contributing scenarios	Tonnage per use (t/year)	Daily local tonnage (t/day)	Annual local tonnage (t/year)
	indoor) (ERC 8a)			
ES8 (C)	Consumer end-use of air care products	5		
	- ERC 8a: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC 8a)		2.75E-6	-
ES9 (C)	Consumer end-use of washing and cleaning products	5		
	- ERC 8a: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC 8a)		2.75E-6	-
	- ERC 8d: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) (ERC 8d)		2.75E-6	-
ES10 (C)	Consumer end-use of biocides	5		
	- ERC 8a: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC 8a)		2.75E-6	-
	- ERC 8d: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) (ERC 8d)		2.75E-6	-

9.0.3.2. Scope and type of assessment for the environment

The scope of exposure assessment and type of risk characterisation required for the environment are described in the following table based on the hazard conclusions presented in section 7.

Table 9.2. Type of risk characterisation required for the environment

Protection target	Risk characterisation type	Hazard conclusion (see section 7)
Fresh water	Quantitative	PNEC aqua (freshwater) = 3E-3 mg/L
Sediment (freshwater)	Quantitative	PNEC sediment (freshwater) = 0.09 mg/kg sediment dw
Marine water	Quantitative	PNEC aqua (marine water) = 3E-4 mg/L
Sediment (marine water)	Quantitative	PNEC sediment (marine water) = 9E-3 mg/kg sediment dw
Sewage Treatment Plant	Not needed	No hazard identified
Air	Not needed	No hazard identified
Agricultural soil	Quantitative	PNEC soil = 0.07 mg/kg soil dw
Predator's prey (freshwater)	Qualitative	No data available: testing technically not feasible
Predator's prey (marine water)	Qualitative	No data available: testing technically not feasible
Top predator's prey (marine water)	Qualitative	No data available: testing technically not feasible
Predator's prey (terrestrial)	Qualitative	No data available: testing technically not feasible

9.0.3.3. Fate and distribution parameters

Physicochemical properties used for exposure estimation

The following substance properties are used in the fate estimation done by EUSES. They correspond to the "value used for CSA" reported in sections 1 and 4.

Table 9.3. Substance key phys-chem and fate properties

Substance property	Value
Molecular weight	≥ 142.2
Molecular weight used for the assessment	142.2
Vapour pressure	0.1 kPa at 20 °C
Partition coefficient (Log Kow)	1.5 at 20 °C
Water solubility	5.6 g/L at 20 °C
Biodegradation in water: screening tests	readily biodegradable
Adsorption/Desorption: Koc at 20 °C	1.35E3

Fate (release percentage) in the modelled biological sewage treatment plant

In a standard (modelled) biological STP, the emissions are distributed in the following way:

Release to water	11.26%
Release to air	0.574%
Release to sludge	10.8%
Release degraded	77.37%

The above fractions are calculated by the SIMPLETREAT model integrated in EUSES.

9.0.3.4. Comments on assessment approach for the environment

The regional concentrations are reported in section 10.2.1.1. The local Predicted Exposure Concentrations (PECs) reported for each contributing scenario correspond to the sum of the local concentrations (Clocal) and the regional concentrations (PEC regional).

9.0.3.5. Scope and type of assessment for man via environment

The scope of exposure assessment and type of risk characterisation required for man via the environment are described in the following table based on the hazard conclusions presented in section 5.11.

Table 9.4. Type of risk characterisation required for man via the environment

Route of exposure and type of effects	Risk characterisation type	Hazard conclusion (see section 5.11)
Inhalation: Long term, Systemic	Quantitative	DNEL (Derived No Effect Level) = 2.17 mg/m³
Oral: Long term, Systemic	Quantitative	DNEL (Derived No Effect Level) = 1.25 mg/kg bw/day

9.0.4. Introduction to the assessment for workers

9.0.4.1. Scope and type of assessment for workers

The scope of exposure assessment and type of risk characterisation required for workers are described in the following table based on the hazard conclusions presented in section 5.11.

Table 9.5. Type of risk characterisation required for workers

Route	Type of effect	Risk characterisation type	Hazard conclusion (see section 5.11)
Inhalation	Systemic effects - long term	Quantitative	DNEL (Derived No Effect Level) = 8.82 mg/m³
	Systemic effects - acute	Not needed	No hazard identified
	Local effects - long	Qualitative	Low hazard (no threshold derived)

Route	Type of effect	Risk characterisation type	Hazard conclusion (see section 5.11)
	term		
	Local effects - acute	Qualitative	Low hazard (no threshold derived)
Dermal	Systemic effects - long term	Quantitative	DNEL (Derived No Effect Level) = 2.5 mg/kg bw/day
	Systemic effects - acute	Not needed	No hazard identified
	Local effects - long term	Qualitative	Low hazard (no threshold derived)
	Local effects - acute	Qualitative	Low hazard (no threshold derived)
Eye	Local effects	Not needed	No hazard identified

9.0.5. Introduction to the assessment for consumers

9.0.5.1. Scope and type of assessment for consumers

The scope of exposure assessment and type of risk characterisation required for consumers are described in the following table based on the hazard conclusions reported and justified in section 5.11.

Table 9.6. Type of risk characterisation required for consumers

Route	Type of effect	Risk characterisation type	Hazard conclusion (see section 5.11)
Inhalation	Systemic effects - long term	Quantitative	DNEL (Derived No Effect Level) = 2.17 mg/m³
	Systemic effects - acute	Not needed	No hazard identified
	Local effects - long term	Qualitative	Low hazard (no threshold derived)
	Local effects - acute	Qualitative	Low hazard (no threshold derived)
Dermal	Systemic effects - long term	Quantitative	DNEL (Derived No Effect Level) = 1.25 mg/kg bw/day
	Systemic effects - acute	Not needed	No hazard identified
	Local effects - long term	Qualitative	Low hazard (no threshold derived)
	Local effects - acute	Qualitative	Low hazard (no threshold derived)
Oral	Systemic effects - long term	Quantitative	DNEL (Derived No Effect Level) = 1.25 mg/kg bw/day
Eye	Local effects	Not needed	No hazard identified

9.1. Exposure scenario 1: Formulation or re-packing - Formulation of fragrance compounds

Environment contributing scenario(s):		
CS 1	ERC 2: Formulation into mixture	ERC 2
Worker contributing scenario(s):		
CS 2	PROC 1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.	PROC 1
CS 3	PROC 3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition.	PROC 3
CS 4	PROC 5: Mixing or blending in batch processes	PROC 5
CS 5	PROC 8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities	PROC 8a
CS 6	PROC 8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities	PROC 8b
CS 7	PROC 9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing)	PROC 9
CS 8	PROC 15: Use as laboratory reagent	PROC 15

9.1.1. Env CS 1: ERC 2: Formulation into mixture (ERC 2)

9.1.1.1. Conditions of use

Amount used, frequency and duration of use (or from service life)
• Daily use amount at site: <= 0.1 tonnes/day
• Annual use amount at site: <= 1.0 tonnes/year
Conditions and measures related to biological sewage treatment plant
• Biological STP: Standard [Effectiveness Water: 88.74%]
• Discharge rate of STP: >= 2000 m3/day
• Application of the STP sludge on agricultural soil: Yes
Conditions and measures related to external treatment of waste (including article waste)
• Particular considerations on the waste treatment operations
Other conditions affecting environmental exposure
• Receiving surface water flow rate: >= 18000 m3/day

9.1.1.2. Releases

The local releases to the environment are reported in the following table. Note that the releases reported do not account for the removal in the modelled biological STP.

Table 9.7. Local releases to the environment

Release	Release estimation method	Explanations
Water	Estimated release factor	**Release factor before on site RMM:** 0.1% **Release factor after on site RMM:** 0.1% **Local release rate:** 0.1 kg/day
Air	ERC	**Release factor before on site RMM:** 2.5% **Release factor after on site RMM:** 2.5% **Local release rate:** 2.5 kg/day

Release	Release estimation method	Explanations
Non agricultural soil	ERC	**Release factor after on site RMM:** 0.01%

9.1.1.3. Exposure and risks for the environment and man via the environment

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table. The exposure estimates have been obtained with EUSES 2.1.2 unless stated otherwise.

Table 9.8. Exposure concentrations and risks for the environment and man via the environment

Protection target	Exposure concentration	Risk quantification
Fresh water	**Local PEC:** 5.67E-4 mg/L	RCR = 0.189
Sediment (freshwater)	**Local PEC:** 0.079 mg/kg dw	RCR = 0.872
Marine water	**Local PEC:** 5.66E-5 mg/L	RCR = 0.189
Sediment (marine water)	**Local PEC:** 7.85E-3 mg/kg dw	RCR = 0.872
Agricultural soil	**Local PEC:** 0.016 mg/kg dw	RCR = 0.232
Predator's prey (freshwater)	**Local PEC:** 4.76E-5 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Predator's prey (marine water)	**Local PEC:** 4.64E-6 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Top predator's prey (marine water)	**Local PEC:** 2.32E-6 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Predator's prey (terrestrial)	**Local PEC:** 3.37E-4 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Man via environment - Inhalation	**Concentration in air:** 1.93E-5 mg/m³	RCR < 0.01
Man via environment - Oral	**Exposure via food consumption:** 7.6E-6 mg/kg bw/day	RCR < 0.01
Man via environment - combined routes		RCR < 0.01

9.1.2. Worker CS 2: PROC 1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions. (PROC 1)

9.1.2.1. Conditions of use

	Method
Product (Article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 100.0 %	TRA Workers 3.0
• Physical form of the used product: Liquid	TRA Workers 3.0
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8.0 h/day	TRA Workers 3.0

	Method
Technical and organisational conditions and measures	
• General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%]	TRA Workers 3.0
• Occupational Health and Safety Management System: Advanced	TRA Workers 3.0
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%]	TRA Workers 3.0
Conditions and measures related to personal protection, hygiene and health evaluation	
• Respiratory protection: No [Effectiveness Inhalation: 0%]	TRA Workers 3.0
• Dermal protection: No [Effectiveness Dermal: 0%]	TRA Workers 3.0
Other conditions affecting workers exposure	
• Place of use: Indoor	TRA Workers 3.0
• Operating temperature: <= 40.0 °C	TRA Workers 3.0

9.1.2.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.9. Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	0.059 mg/m³ (TRA Workers)	RCR < 0.01
Inhalation, local, long term	0.059 mg/m³ (TRA Workers)	
Inhalation, local, acute	0.237 mg/m³ (TRA Workers)	
Dermal, systemic, long term	0.034 mg/kg bw/day (TRA Workers)	RCR = 0.014
Dermal, local, long term	9.92E-3 mg/cm² (TRA Workers)	
Dermal, local, acute	9.92E-3 mg/cm² (TRA Workers)	
Combined routes, systemic, long-term		RCR = 0.02

Remarks on exposure dataset obtained with ECETOC TRA

The vapour pressure at operating temperature (40°C) used for the calculation is 370.7 Pa.

9.1.3. Worker CS 3: PROC 3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition. (PROC 3)

9.1.3.1. Conditions of use

	Method
Product (Article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 100.0 %	TRA Workers 3.0
• Physical form of the used product: Liquid	TRA Workers 3.0
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8.0 h/day	TRA Workers 3.0
Technical and organisational conditions and measures	
• General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%]	TRA Workers 3.0
• Occupational Health and Safety Management System: Advanced	TRA Workers 3.0

	Method
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%]	TRA Workers 3.0
Conditions and measures related to personal protection, hygiene and health evaluation	
• Respiratory protection: Yes (Respirator with APF of 10) [Effectiveness Inhalation: 90%]	TRA Workers 3.0
• Dermal protection: No [Effectiveness Dermal: 0%]	TRA Workers 3.0
Other conditions affecting workers exposure	
• Place of use: Indoor	TRA Workers 3.0
• Operating temperature: <= 40.0 °C	TRA Workers 3.0

9.1.3.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.10. Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	1.777 mg/m³ (TRA Workers)	RCR = 0.202
Inhalation, local, long term	1.777 mg/m³ (TRA Workers)	
Inhalation, local, acute	7.11 mg/m³ (TRA Workers)	
Dermal, systemic, long term	0.69 mg/kg bw/day (TRA Workers)	RCR = 0.276
Dermal, local, long term	0.201 mg/cm² (TRA Workers)	
Dermal, local, acute	0.201 mg/cm² (TRA Workers)	
Combined routes, systemic, long-term		RCR = 0.478

Remarks on exposure dataset obtained with ECETOC TRA

The vapour pressure at operating temperature (40°C) used for the calculation is 370.7 Pa.

9.1.4. Worker CS 4: PROC 5: Mixing or blending in batch processes (PROC 5)

9.1.4.1. Conditions of use

	Method
Product (Article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 100.0 %	TRA Workers 3.0
• Physical form of the used product: Liquid	TRA Workers 3.0
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8.0 h/day	TRA Workers 3.0
Technical and organisational conditions and measures	
• General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%]	TRA Workers 3.0
• Occupational Health and Safety Management System: Advanced	TRA Workers 3.0
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%]	TRA Workers 3.0
Conditions and measures related to personal protection, hygiene and health evaluation	
• Respiratory protection: Yes (Respirator with APF of 10) [Effectiveness Inhalation: 90%]	TRA Workers 3.0
• Dermal protection: Yes (Chemically resistant gloves conforming to EN374 with basic	TRA Workers 3.0

	Method
employee training) and (other) appropriate dermal protection [Effectiveness Dermal: 90%]	
Other conditions affecting workers exposure	
• Place of use: Indoor	TRA Workers 3.0
• Operating temperature: <= 40.0 °C	TRA Workers 3.0

9.1.4.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.11. Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	2.962 mg/m³ (TRA Workers)	RCR = 0.336
Inhalation, local, long term	2.962 mg/m³ (TRA Workers)	
Inhalation, local, acute	11.85 mg/m³ (TRA Workers)	
Dermal, systemic, long term	1.371 mg/kg bw/day (TRA Workers)	RCR = 0.548
Dermal, local, long term	0.2 mg/cm² (TRA Workers)	
Dermal, local, acute	0.2 mg/cm² (TRA Workers)	
Combined routes, systemic, long-term		RCR = 0.884

Remarks on exposure dataset obtained with ECETOC TRA

The vapour pressure at operating temperature (40°C) used for the calculation is 370.7 Pa.

9.1.5. Worker CS 5: PROC 8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC 8a)

9.1.5.1. Conditions of use

	Method
Product (Article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 100.0 %	TRA Workers 3.0
• Physical form of the used product: Liquid	TRA Workers 3.0
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8.0 h/day	TRA Workers 3.0
Technical and organisational conditions and measures	
• General ventilation: Enhanced general ventilation (5-10 air changes per hour) [Effectiveness Inhalation: 70%]	TRA Workers 3.0
• Occupational Health and Safety Management System: Advanced	TRA Workers 3.0
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%]	TRA Workers 3.0
Conditions and measures related to personal protection, hygiene and health evaluation	
• Respiratory protection: Yes (Respirator with APF of 10) [Effectiveness Inhalation: 90%]	TRA Workers 3.0
• Dermal protection: Yes (Chemically resistant gloves conforming to EN374 with basic employee training) and (other) appropriate dermal protection [Effectiveness Dermal: 90%]	TRA Workers 3.0
Other conditions affecting workers exposure	

	Method
• Place of use: Indoor	TRA Workers 3.0
• Operating temperature: <= 40.0 °C	TRA Workers 3.0

9.1.5.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.12. Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	1.777 mg/m³ (TRA Workers)	RCR = 0.202
Inhalation, local, long term	1.777 mg/m³ (TRA Workers)	
Inhalation, local, acute	7.11 mg/m³ (TRA Workers)	
Dermal, systemic, long term	1.371 mg/kg bw/day (TRA Workers)	RCR = 0.548
Dermal, local, long term	0.1 mg/cm² (TRA Workers)	
Dermal, local, acute	0.1 mg/cm² (TRA Workers)	
Combined routes, systemic, long-term		RCR = 0.75

Remarks on exposure dataset obtained with ECETOC TRA

The vapour pressure at operating temperature (40°C) used for the calculation is 370.7 Pa.

9.1.6. Worker CS 6: PROC 8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC 8b)

9.1.6.1. Conditions of use

	Method
Product (Article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 100.0 %	TRA Workers 3.0
• Physical form of the used product: Liquid	TRA Workers 3.0
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8.0 h/day	TRA Workers 3.0
Technical and organisational conditions and measures	
• General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%]	TRA Workers 3.0
• Occupational Health and Safety Management System: Advanced	TRA Workers 3.0
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%]	TRA Workers 3.0
Conditions and measures related to personal protection, hygiene and health evaluation	
• Respiratory protection: Yes (Respirator with APF of 10) [Effectiveness Inhalation: 90%]	TRA Workers 3.0
• Dermal protection: Yes (Chemically resistant gloves conforming to EN374 with basic employee training) and (other) appropriate dermal protection [Effectiveness Dermal: 90%]	TRA Workers 3.0
Other conditions affecting workers exposure	
• Place of use: Indoor	TRA Workers 3.0
• Operating temperature: <= 40.0 °C	TRA Workers 3.0

9.1.6.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.13. Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	2.962 mg/m³ (TRA Workers)	RCR = 0.336
Inhalation, local, long term	2.962 mg/m³ (TRA Workers)	
Inhalation, local, acute	11.85 mg/m³ (TRA Workers)	
Dermal, systemic, long term	1.371 mg/kg bw/day (TRA Workers)	RCR = 0.548
Dermal, local, long term	0.1 mg/cm² (TRA Workers)	
Dermal, local, acute	0.1 mg/cm² (TRA Workers)	
Combined routes, systemic, long-term		RCR = 0.884

Remarks on exposure dataset obtained with ECETOC TRA

The vapour pressure at operating temperature (40°C) used for the calculation is 370.7 Pa.

9.1.7. Worker CS 7: PROC 9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC 9)

9.1.7.1. Conditions of use

	Method
Product (Article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 100.0 %	TRA Workers 3.0
• Physical form of the used product: Liquid	TRA Workers 3.0
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8.0 h/day	TRA Workers 3.0
Technical and organisational conditions and measures	
• General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%]	TRA Workers 3.0
• Occupational Health and Safety Management System: Advanced	TRA Workers 3.0
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%]	TRA Workers 3.0
Conditions and measures related to personal protection, hygiene and health evaluation	
• Respiratory protection: Yes (Respirator with APF of 10) [Effectiveness Inhalation: 90%]	TRA Workers 3.0
• Dermal protection: Yes (Chemically resistant gloves conforming to EN374 with basic employee training) and (other) appropriate dermal protection [Effectiveness Dermal: 90%]	TRA Workers 3.0
Other conditions affecting workers exposure	
• Place of use: Indoor	TRA Workers 3.0
• Operating temperature: <= 40.0 °C	TRA Workers 3.0

9.1.7.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.14. Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	2.962 mg/m³ (TRA Workers)	RCR = 0.336
Inhalation, local, long term	2.962 mg/m³ (TRA Workers)	
Inhalation, local, acute	11.85 mg/m³ (TRA Workers)	
Dermal, systemic, long term	0.686 mg/kg bw/day (TRA Workers)	RCR = 0.274
Dermal, local, long term	0.1 mg/cm² (TRA Workers)	
Dermal, local, acute	0.1 mg/cm² (TRA Workers)	
Combined routes, systemic, long-term		RCR = 0.61

Remarks on exposure dataset obtained with ECETOC TRA

The vapour pressure at operating temperature (40°C) used for the calculation is 370.7 Pa.

9.1.8. Worker CS 8: PROC 15: Use as laboratory reagent (PROC 15)

9.1.8.1. Conditions of use

	Method
Product (Article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 100.0 %	TRA Workers 3.0
• Physical form of the used product: Liquid	TRA Workers 3.0
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8.0 h/day	TRA Workers 3.0
Technical and organisational conditions and measures	
• General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%]	TRA Workers 3.0
• Occupational Health and Safety Management System: Advanced	TRA Workers 3.0
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%]	TRA Workers 3.0
Conditions and measures related to personal protection, hygiene and health evaluation	
• Respiratory protection: Yes (Respirator with APF of 10) [Effectiveness Inhalation: 90%]	TRA Workers 3.0
• Dermal protection: No [Effectiveness Dermal: 0%]	TRA Workers 3.0
Other conditions affecting workers exposure	
• Place of use: Indoor	TRA Workers 3.0
• Operating temperature: <= 40.0 °C	TRA Workers 3.0

9.1.8.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.15. Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	2.962 mg/m³ (TRA Workers)	RCR = 0.336
Inhalation, local, long term	2.962 mg/m³ (TRA Workers)	
Inhalation, local, acute	11.85 mg/m³ (TRA Workers)	
Dermal, systemic, long term	0.34 mg/kg bw/day (TRA Workers)	RCR = 0.136
Dermal, local, long term	0.099 mg/cm² (TRA Workers)	

Route of exposure and type of effects	Exposure concentration	Risk quantification
Dermal, local, acute	0.099 mg/cm² (TRA Workers)	
Combined routes, systemic, long-term		RCR = 0.472

Remarks on exposure dataset obtained with ECETOC TRA

The vapour pressure at operating temperature (40°C) used for the calculation is 370.7 Pa.

9.2. Exposure scenario 2: Formulation or re-packing - Formulation of fragranced end-products

Environment contributing scenario(s):		
CS 1	ERC 2: Formulation into mixture	ERC 2
Worker contributing scenario(s):		
CS 2	PROC 1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.	PROC 1
CS 3	PROC 3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition.	PROC 3
CS 4	PROC 5: Mixing or blending in batch processes	PROC 5
CS 5	PROC 8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities	PROC 8a
CS 6	PROC 8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities	PROC 8b
CS 7	PROC 9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing)	PROC 9
CS 8	PROC 14: Tabletting, compression, extrusion,pelletisation, granulation	PROC 14
CS 9	PROC 15: Use as laboratory reagent	PROC 15

9.2.1. Env CS 1: ERC 2: Formulation into mixture (ERC 2)

9.2.1.1. Conditions of use

Amount used, frequency and duration of use (or from service life)
• Daily use amount at site: <= 0.1 tonnes/day
• Annual use amount at site: <= 1.0 tonnes/year
Conditions and measures related to biological sewage treatment plant
• Biological STP: Standard [Effectiveness Water: 88.74%]
• Discharge rate of STP: >= 2000 m3/day
• Application of the STP sludge on agricultural soil: Yes
Conditions and measures related to external treatment of waste (including article waste)
• Particular considerations on the waste treatment operations
Other conditions affecting environmental exposure
• Receiving surface water flow rate: >= 18000 m3/day

9.2.1.2. Releases

The local releases to the environment are reported in the following table. Note that the releases reported do not account for the removal in the modelled biological STP.

Table 9.16. Local releases to the environment

Release	Release estimation method	Explanations
Water	Estimated release factor	**Release factor before on site RMM:** 0.1% **Release factor after on site RMM:** 0.1% **Local release rate:** 0.1 kg/day

Release	Release estimation method	Explanations
Air	ERC	**Release factor before on site RMM:** 2.5% **Release factor after on site RMM:** 2.5% **Local release rate:** 2.5 kg/day
Non agricultural soil	ERC	**Release factor after on site RMM:** 0.01%

9.2.1.3. Exposure and risks for the environment and man via the environment

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table. The exposure estimates have been obtained with EUSES 2.1.2 unless stated otherwise.

Table 9.17. Exposure concentrations and risks for the environment and man via the environment

Protection target	Exposure concentration	Risk quantification
Fresh water	**Local PEC:** 5.67E-4 mg/L	RCR = 0.189
Sediment (freshwater)	**Local PEC:** 0.079 mg/kg dw	RCR = 0.872
Marine water	**Local PEC:** 5.66E-5 mg/L	RCR = 0.189
Sediment (marine water)	**Local PEC:** 7.85E-3 mg/kg dw	RCR = 0.872
Agricultural soil	**Local PEC:** 0.016 mg/kg dw	RCR = 0.232
Predator's prey (freshwater)	**Local PEC:** 4.76E-5 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Predator's prey (marine water)	**Local PEC:** 4.64E-6 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Top predator's prey (marine water)	**Local PEC:** 2.32E-6 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Predator's prey (terrestrial)	**Local PEC:** 3.37E-4 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Man via environment - Inhalation	**Concentration in air:** 1.93E-5 mg/m³	RCR < 0.01
Man via environment - Oral	**Exposure via food consumption:** 7.6E-6 mg/kg bw/day	RCR < 0.01
Man via environment - combined routes		RCR < 0.01

9.2.2. Worker CS 2: PROC 1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions. (PROC 1)

9.2.2.1. Conditions of use

	Method
Product (Article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 100.0 %	TRA Workers 3.0
• Physical form of the used product: Liquid	TRA Workers 3.0

	Method
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8.0 h/day	TRA Workers 3.0
Technical and organisational conditions and measures	
• General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%]	TRA Workers 3.0
• Occupational Health and Safety Management System: Advanced	TRA Workers 3.0
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%]	TRA Workers 3.0
Conditions and measures related to personal protection, hygiene and health evaluation	
• Respiratory protection: No [Effectiveness Inhalation: 0%]	TRA Workers 3.0
• Dermal protection: No [Effectiveness Dermal: 0%]	TRA Workers 3.0
Other conditions affecting workers exposure	
• Place of use: Indoor	TRA Workers 3.0
• Operating temperature: <= 40.0 °C	TRA Workers 3.0

9.2.2.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.18. Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	0.059 mg/m³ (TRA Workers)	RCR < 0.01
Inhalation, local, long term	0.059 mg/m³ (TRA Workers)	
Inhalation, local, acute	0.237 mg/m³ (TRA Workers)	
Dermal, systemic, long term	0.034 mg/kg bw/day (TRA Workers)	RCR = 0.014
Dermal, local, long term	9.92E-3 mg/cm² (TRA Workers)	
Dermal, local, acute	9.92E-3 mg/cm² (TRA Workers)	
Combined routes, systemic, long-term		RCR = 0.02

Remarks on exposure dataset obtained with ECETOC TRA

The vapour pressure at operating temperature (40°C) used for the calculation is 370.7 Pa.

9.2.3. Worker CS 3: PROC 3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition. (PROC 3)

9.2.3.1. Conditions of use

	Method
Product (Article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 100.0 %	TRA Workers 3.0
• Physical form of the used product: Liquid	TRA Workers 3.0
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8.0 h/day	TRA Workers 3.0
Technical and organisational conditions and measures	
• General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness	TRA Workers 3.0

	Method
Inhalation: 0%]	
• Occupational Health and Safety Management System: Advanced	TRA Workers 3.0
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%]	TRA Workers 3.0
Conditions and measures related to personal protection, hygiene and health evaluation	
• Respiratory protection: Yes (Respirator with APF of 10) [Effectiveness Inhalation: 90%]	TRA Workers 3.0
• Dermal protection: No [Effectiveness Dermal: 0%]	TRA Workers 3.0
Other conditions affecting workers exposure	
• Place of use: Indoor	TRA Workers 3.0
• Operating temperature: <= 40.0 °C	TRA Workers 3.0

9.2.3.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.19. Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	1.777 mg/m³ (TRA Workers)	RCR = 0.202
Inhalation, local, long term	1.777 mg/m³ (TRA Workers)	
Inhalation, local, acute	7.11 mg/m³ (TRA Workers)	
Dermal, systemic, long term	0.69 mg/kg bw/day (TRA Workers)	RCR = 0.276
Dermal, local, long term	0.201 mg/cm² (TRA Workers)	
Dermal, local, acute	0.201 mg/cm² (TRA Workers)	
Combined routes, systemic, long-term		RCR = 0.478

Remarks on exposure dataset obtained with ECETOC TRA

The vapour pressure at operating temperature (40°C) used for the calculation is 370.7 Pa.

9.2.4. Worker CS 4: PROC 5: Mixing or blending in batch processes (PROC 5)

9.2.4.1. Conditions of use

	Method
Product (Article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 100.0 %	TRA Workers 3.0
• Physical form of the used product: Liquid	TRA Workers 3.0
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8.0 h/day	TRA Workers 3.0
Technical and organisational conditions and measures	
• General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%]	TRA Workers 3.0
• Occupational Health and Safety Management System: Advanced	TRA Workers 3.0
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%]	TRA Workers 3.0
Conditions and measures related to personal protection, hygiene and health evaluation	

	Method
• Respiratory protection: Yes (Respirator with APF of 10) [Effectiveness Inhalation: 90%]	TRA Workers 3.0
• Dermal protection: Yes (Chemically resistant gloves conforming to EN374 with basic employee training) and (other) appropriate dermal protection [Effectiveness Dermal: 90%]	TRA Workers 3.0
Other conditions affecting workers exposure	
• Place of use: Indoor	TRA Workers 3.0
• Operating temperature: <= 40.0 °C	TRA Workers 3.0

9.2.4.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.20. Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	2.962 mg/m³ (TRA Workers)	RCR = 0.336
Inhalation, local, long term	2.962 mg/m³ (TRA Workers)	
Inhalation, local, acute	11.85 mg/m³ (TRA Workers)	
Dermal, systemic, long term	1.371 mg/kg bw/day (TRA Workers)	RCR = 0.548
Dermal, local, long term	0.2 mg/cm² (TRA Workers)	
Dermal, local, acute	0.2 mg/cm² (TRA Workers)	
Combined routes, systemic, long-term		RCR = 0.884

Remarks on exposure dataset obtained with ECETOC TRA

The vapour pressure at operating temperature (40°C) used for the calculation is 370.7 Pa.

9.2.5. Worker CS 5: PROC 8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC 8a)

9.2.5.1. Conditions of use

	Method
Product (Article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 100.0 %	TRA Workers 3.0
• Physical form of the used product: Liquid	TRA Workers 3.0
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8.0 h/day	TRA Workers 3.0
Technical and organisational conditions and measures	
• General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%]	TRA Workers 3.0
• Occupational Health and Safety Management System: Advanced	TRA Workers 3.0
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%]	TRA Workers 3.0
Conditions and measures related to personal protection, hygiene and health evaluation	
• Respiratory protection: Yes (Respirator with APF of 10) [Effectiveness Inhalation: 90%]	TRA Workers 3.0
• Dermal protection: Yes (Chemically resistant gloves conforming to EN374 with specific activity training) and (other) appropriate dermal protection [Effectiveness	TRA Workers 3.0

	Method
Dermal: 95%]	
Other conditions affecting workers exposure	
• Place of use: Indoor	TRA Workers 3.0
• Operating temperature: <= 40.0 °C	TRA Workers 3.0

9.2.5.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.21. Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	5.925 mg/m³ (TRA Workers)	RCR = 0.672
Inhalation, local, long term	5.925 mg/m³ (TRA Workers)	
Inhalation, local, acute	23.7 mg/m³ (TRA Workers)	
Dermal, systemic, long term	0.685 mg/kg bw/day (TRA Workers)	RCR = 0.274
Dermal, local, long term	0.05 mg/cm² (TRA Workers)	
Dermal, local, acute	0.05 mg/cm² (TRA Workers)	
Combined routes, systemic, long-term		RCR = 0.946

Remarks on exposure dataset obtained with ECETOC TRA

The vapour pressure at operating temperature (40°C) used for the calculation is 370.7 Pa.

9.2.6. Worker CS 6: PROC 8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC 8b)

9.2.6.1. Conditions of use

	Method
Product (Article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 100.0 %	TRA Workers 3.0
• Physical form of the used product: Liquid	TRA Workers 3.0
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8.0 h/day	TRA Workers 3.0
Technical and organisational conditions and measures	
• General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%]	TRA Workers 3.0
• Occupational Health and Safety Management System: Advanced	TRA Workers 3.0
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%]	TRA Workers 3.0
Conditions and measures related to personal protection, hygiene and health evaluation	
• Respiratory protection: Yes (Respirator with APF of 10) [Effectiveness Inhalation: 90%]	TRA Workers 3.0
• Dermal protection: Yes (Chemically resistant gloves conforming to EN374 with basic employee training) and (other) appropriate dermal protection [Effectiveness Dermal: 90%]	TRA Workers 3.0
Other conditions affecting workers exposure	
• Place of use: Indoor	TRA Workers 3.0

	Method
• Operating temperature: <= 40.0 °C	TRA Workers 3.0

9.2.6.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.22. Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	2.962 mg/m³ (TRA Workers)	RCR = 0.336
Inhalation, local, long term	2.962 mg/m³ (TRA Workers)	
Inhalation, local, acute	11.85 mg/m³ (TRA Workers)	
Dermal, systemic, long term	1.371 mg/kg bw/day (TRA Workers)	RCR = 0.548
Dermal, local, long term	0.1 mg/cm² (TRA Workers)	
Dermal, local, acute	0.1 mg/cm² (TRA Workers)	
Combined routes, systemic, long-term		RCR = 0.884

Remarks on exposure dataset obtained with ECETOC TRA

The vapour pressure at operating temperature (40°C) used for the calculation is 370.7 Pa.

9.2.7. Worker CS 7: PROC 9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC 9)

9.2.7.1. Conditions of use

	Method
Product (Article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 100.0 %	TRA Workers 3.0
• Physical form of the used product: Liquid	TRA Workers 3.0
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8.0 h/day	TRA Workers 3.0
Technical and organisational conditions and measures	
• General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%]	TRA Workers 3.0
• Occupational Health and Safety Management System: Advanced	TRA Workers 3.0
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%]	TRA Workers 3.0
Conditions and measures related to personal protection, hygiene and health evaluation	
• Respiratory protection: Yes (Respirator with APF of 10) [Effectiveness Inhalation: 90%]	TRA Workers 3.0
• Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness Dermal: 80%]	TRA Workers 3.0
Other conditions affecting workers exposure	
• Place of use: Indoor	TRA Workers 3.0
• Operating temperature: <= 40.0 °C	TRA Workers 3.0

9.2.7.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.23. Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	2.962 mg/m³ (TRA Workers)	RCR = 0.336
Inhalation, local, long term	2.962 mg/m³ (TRA Workers)	
Inhalation, local, acute	11.85 mg/m³ (TRA Workers)	
Dermal, systemic, long term	1.372 mg/kg bw/day (TRA Workers)	RCR = 0.549
Dermal, local, long term	0.2 mg/cm² (TRA Workers)	
Dermal, local, acute	0.2 mg/cm² (TRA Workers)	
Combined routes, systemic, long-term		RCR = 0.885

Remarks on exposure dataset obtained with ECETOC TRA

The vapour pressure at operating temperature (40°C) used for the calculation is 370.7 Pa.

9.2.8. Worker CS 8: PROC 14: Tabletting, compression, extrusion,pelletisation, granulation (PROC 14)

9.2.8.1. Conditions of use

	Method
Product (Article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 100.0 %	TRA Workers 3.0
• Physical form of the used product: Liquid	TRA Workers 3.0
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8.0 h/day	TRA Workers 3.0
Technical and organisational conditions and measures	
• General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%]	TRA Workers 3.0
• Occupational Health and Safety Management System: Advanced	TRA Workers 3.0
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%]	TRA Workers 3.0
Conditions and measures related to personal protection, hygiene and health evaluation	
• Respiratory protection: Yes (Respirator with APF of 10) [Effectiveness Inhalation: 90%]	TRA Workers 3.0
• Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness Dermal: 80%]	TRA Workers 3.0
Other conditions affecting workers exposure	
• Place of use: Indoor	TRA Workers 3.0
• Operating temperature: <= 40.0 °C	TRA Workers 3.0

9.2.8.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.24. Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	2.962 mg/m³ (TRA Workers)	RCR = 0.336
Inhalation, local, long term	2.962 mg/m³ (TRA Workers)	

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, local, acute	11.85 mg/m³ (TRA Workers)	
Dermal, systemic, long term	0.686 mg/kg bw/day (TRA Workers)	RCR = 0.274
Dermal, local, long term	0.1 mg/cm² (TRA Workers)	
Dermal, local, acute	0.1 mg/cm² (TRA Workers)	
Combined routes, systemic, long-term		RCR = 0.61

Remarks on exposure dataset obtained with ECETOC TRA

The vapour pressure at operating temperature (40°C) used for the calculation is 370.7 Pa.

9.2.9. Worker CS 9: PROC 15: Use as laboratory reagent (PROC 15)

9.2.9.1. Conditions of use

	Method
Product (Article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 100.0 %	TRA Workers 3.0
• Physical form of the used product: Liquid	TRA Workers 3.0
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8.0 h/day	TRA Workers 3.0
Technical and organisational conditions and measures	
• General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%]	TRA Workers 3.0
• Occupational Health and Safety Management System: Advanced	TRA Workers 3.0
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%]	TRA Workers 3.0
Conditions and measures related to personal protection, hygiene and health evaluation	
• Respiratory protection: Yes (Respirator with APF of 10) [Effectiveness Inhalation: 90%]	TRA Workers 3.0
• Dermal protection: No [Effectiveness Dermal: 0%]	TRA Workers 3.0
Other conditions affecting workers exposure	
• Place of use: Indoor	TRA Workers 3.0
• Operating temperature: <= 40.0 °C	TRA Workers 3.0

9.2.9.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.25. Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	2.962 mg/m³ (TRA Workers)	RCR = 0.336
Inhalation, local, long term	2.962 mg/m³ (TRA Workers)	
Inhalation, local, acute	11.85 mg/m³ (TRA Workers)	
Dermal, systemic, long term	0.34 mg/kg bw/day (TRA Workers)	RCR = 0.136
Dermal, local, long term	0.099 mg/cm² (TRA Workers)	
Dermal, local, acute	0.099 mg/cm² (TRA Workers)	
Combined routes, systemic,		RCR = 0.472

Route of exposure and type of effects	Exposure concentration	Risk quantification
long-term		

Remarks on exposure dataset obtained with ECETOC TRA

The vapour pressure at operating temperature (40°C) used for the calculation is 370.7 Pa.

9.3. Exposure scenario 3: Use at industrial sites - Industrial end-use of washing and cleaning products

Product category used: PC 35: Washing and Cleaning Products
Sector of use: SU 0: Other

Environment contributing scenario(s):		
CS 1	ERC 4: Use of non-reactive processing aid at industrial site (no inclusion into or onto article)	ERC 4
Worker contributing scenario(s):		
CS 2	PROC 1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.	PROC 1
CS 3	PROC 2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.	PROC 2
CS 4	PROC 4: Chemical production where opportunity for exposure arises	PROC 4
CS 5	PROC 7: Industrial spraying	PROC 7
CS 6	PROC 8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities	PROC 8b
CS 7	PROC 10: Roller application or brushing	PROC 10
CS 8	PROC 13: Treatment of articles by dipping and pouring	PROC 13

9.3.1. Env CS 1: ERC 4: Use of non-reactive processing aid at industrial site (no inclusion into or onto article) (ERC 4)

9.3.1.1. Conditions of use

Amount used, frequency and duration of use (or from service life)
• Daily use amount at site: <= 0.05 tonnes/day
• Annual use amount at site: <= 1.0 tonnes/year
Conditions and measures related to biological sewage treatment plant
• Biological STP: Standard [Effectiveness Water: 88.74%]
• Discharge rate of STP: >= 2000 m3/day
• Application of the STP sludge on agricultural soil: Yes
Conditions and measures related to external treatment of waste (including article waste)
• Particular considerations on the waste treatment operations
Other conditions affecting environmental exposure
• Receiving surface water flow rate: >= 18000 m3/day

9.3.1.2. Releases

The local releases to the environment are reported in the following table. Note that the releases reported do not account for the removal in the modelled biological STP.

Table 9.26. Local releases to the environment

Release	Release estimation method	Explanations
Water	Estimated release factor	**Release factor before on site RMM:** 0.1% **Release factor after on site RMM:** 0.1%

Release	Release estimation method	Explanations
		Local release rate: 0.05 kg/day
Air	ERC	**Release factor before on site RMM:** 100% **Release factor after on site RMM:** 100% **Local release rate:** 50 kg/day
Non agricultural soil	ERC	**Release factor after on site RMM:** 5%

9.3.1.3. Exposure and risks for the environment and man via the environment

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table. The exposure estimates have been obtained with EUSES 2.1.2 unless stated otherwise.

Table 9.27. Exposure concentrations and risks for the environment and man via the environment

Protection target	Exposure concentration	Risk quantification
Fresh water	**Local PEC:** 2.86E-4 mg/L	RCR = 0.095
Sediment (freshwater)	**Local PEC:** 0.04 mg/kg dw	RCR = 0.44
Marine water	**Local PEC:** 2.86E-5 mg/L	RCR = 0.095
Sediment (marine water)	**Local PEC:** 3.95E-3 mg/kg dw	RCR = 0.439
Agricultural soil	**Local PEC:** 8.26E-3 mg/kg dw	RCR = 0.118
Predator's prey (freshwater)	**Local PEC:** 4.76E-5 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Predator's prey (marine water)	**Local PEC:** 4.64E-6 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Top predator's prey (marine water)	**Local PEC:** 2.32E-6 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Predator's prey (terrestrial)	**Local PEC:** 1.78E-4 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Man via environment - Inhalation	**Concentration in air:** 7.62E-4 mg/m³	RCR < 0.01
Man via environment - Oral	**Exposure via food consumption:** 2.9E-5 mg/kg bw/day	RCR < 0.01
Man via environment - combined routes		RCR < 0.01

9.3.2. Worker CS 2: PROC 1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions. (PROC 1)

9.3.2.1. Conditions of use

	Method
Product (Article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 100.0 %	TRA Workers 3.0

	Method
• Physical form of the used product: Liquid	TRA Workers 3.0
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8.0 h/day	TRA Workers 3.0
Technical and organisational conditions and measures	
• General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%]	TRA Workers 3.0
• Occupational Health and Safety Management System: Advanced	TRA Workers 3.0
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%]	TRA Workers 3.0
Conditions and measures related to personal protection, hygiene and health evaluation	
• Respiratory protection: No [Effectiveness Inhalation: 0%]	TRA Workers 3.0
• Dermal protection: No [Effectiveness Dermal: 0%]	TRA Workers 3.0
Other conditions affecting workers exposure	
• Place of use: Indoor	TRA Workers 3.0
• Operating temperature: <= 40.0 °C	TRA Workers 3.0

9.3.2.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.28. Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	0.059 mg/m³ (TRA Workers)	RCR < 0.01
Inhalation, local, long term	0.059 mg/m³ (TRA Workers)	
Inhalation, local, acute	0.237 mg/m³ (TRA Workers)	
Dermal, systemic, long term	0.034 mg/kg bw/day (TRA Workers)	RCR = 0.014
Dermal, local, long term	9.92E-3 mg/cm² (TRA Workers)	
Dermal, local, acute	9.92E-3 mg/cm² (TRA Workers)	
Combined routes, systemic, long-term		RCR = 0.02

Remarks on exposure dataset obtained with ECETOC TRA

The vapour pressure at operating temperature (40°C) used for the calculation is 370.7 Pa.

9.3.3. Worker CS 3: PROC 2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions. (PROC 2)

9.3.3.1. Conditions of use

	Method
Product (Article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 100.0 %	TRA Workers 3.0
• Physical form of the used product: Liquid	TRA Workers 3.0
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8.0 h/day	TRA Workers 3.0
Technical and organisational conditions and measures	

	Method
• General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%]	TRA Workers 3.0
• Occupational Health and Safety Management System: Advanced	TRA Workers 3.0
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%]	TRA Workers 3.0
Conditions and measures related to personal protection, hygiene and health evaluation	
• Respiratory protection: Yes (Respirator with APF of 10) [Effectiveness Inhalation: 90%]	TRA Workers 3.0
• Dermal protection: No [Effectiveness Dermal: 0%]	TRA Workers 3.0
Other conditions affecting workers exposure	
• Place of use: Indoor	TRA Workers 3.0
• Operating temperature: <= 40.0 °C	TRA Workers 3.0

9.3.3.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.29. Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	0.593 mg/m³ (TRA Workers)	RCR = 0.067
Inhalation, local, long term	0.593 mg/m³ (TRA Workers)	
Inhalation, local, acute	2.37 mg/m³ (TRA Workers)	
Dermal, systemic, long term	1.37 mg/kg bw/day (TRA Workers)	RCR = 0.548
Dermal, local, long term	0.2 mg/cm² (TRA Workers)	
Dermal, local, acute	0.2 mg/cm² (TRA Workers)	
Combined routes, systemic, long-term		RCR = 0.615

Remarks on exposure dataset obtained with ECETOC TRA

The vapour pressure at operating temperature (40°C) used for the calculation is 370.7 Pa.

9.3.4. Worker CS 4: PROC 4: Chemical production where opportunity for exposure arises (PROC 4)

9.3.4.1. Conditions of use

	Method
Product (Article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 100.0 %	TRA Workers 3.0
• Physical form of the used product: Liquid	TRA Workers 3.0
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8.0 h/day	TRA Workers 3.0
Technical and organisational conditions and measures	
• General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%]	TRA Workers 3.0
• Occupational Health and Safety Management System: Advanced	TRA Workers 3.0
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%]	TRA Workers 3.0
Conditions and measures related to personal protection, hygiene and health evaluation	

	Method
• Respiratory protection: Yes (Respirator with APF of 10) [Effectiveness Inhalation: 90%]	TRA Workers 3.0
• Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness Dermal: 80%]	TRA Workers 3.0
Other conditions affecting workers exposure	
• Place of use: Indoor	TRA Workers 3.0
• Operating temperature: <= 40.0 °C	TRA Workers 3.0

9.3.4.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.30. Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	2.962 mg/m³ (TRA Workers)	RCR = 0.336
Inhalation, local, long term	2.962 mg/m³ (TRA Workers)	
Inhalation, local, acute	11.85 mg/m³ (TRA Workers)	
Dermal, systemic, long term	1.372 mg/kg bw/day (TRA Workers)	RCR = 0.549
Dermal, local, long term	0.2 mg/cm² (TRA Workers)	
Dermal, local, acute	0.2 mg/cm² (TRA Workers)	
Combined routes, systemic, long-term		RCR = 0.885

Remarks on exposure dataset obtained with ECETOC TRA

The vapour pressure at operating temperature (40°C) used for the calculation is 370.7 Pa.

9.3.5. Worker CS 5: PROC 7: Industrial spraying (PROC 7)

9.3.5.1. Conditions of use

	Method
Product (Article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 5.0 %	TRA Workers 3.0
• Physical form of the used product: Liquid	TRA Workers 3.0
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8.0 h/day	TRA Workers 3.0
Technical and organisational conditions and measures	
• General ventilation: Enhanced general ventilation (5-10 air changes per hour) [Effectiveness Inhalation: 70%]	TRA Workers 3.0
• Occupational Health and Safety Management System: Advanced	TRA Workers 3.0
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%]	TRA Workers 3.0
Conditions and measures related to personal protection, hygiene and health evaluation	
• Respiratory protection: Yes (Respirator with APF of 20) [Effectiveness Inhalation: 95%]	TRA Workers 3.0
• Dermal protection: Yes (Chemically resistant gloves conforming to EN374 with specific activity training) and (other) appropriate dermal protection [Effectiveness Dermal: 95%]	TRA Workers 3.0
Other conditions affecting workers exposure	

	Method
• Place of use: Indoor	TRA Workers 3.0
• Operating temperature: <= 40.0 °C	TRA Workers 3.0

9.3.5.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.31. Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	1.777 mg/m³ (TRA Workers)	RCR = 0.202
Inhalation, local, long term	1.777 mg/m³ (TRA Workers)	
Inhalation, local, acute	7.11 mg/m³ (TRA Workers)	
Dermal, systemic, long term	0.429 mg/kg bw/day (TRA Workers)	RCR = 0.171
Dermal, local, long term	0.02 mg/cm² (TRA Workers)	
Dermal, local, acute	0.02 mg/cm² (TRA Workers)	
Combined routes, systemic, long-term		RCR = 0.373

Remarks on exposure dataset obtained with ECETOC TRA

The vapour pressure at operating temperature (40°C) used for the calculation is 370.7 Pa.

9.3.6. Worker CS 6: PROC 8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC 8b)

9.3.6.1. Conditions of use

	Method
Product (Article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 100.0 %	TRA Workers 3.0
• Physical form of the used product: Liquid	TRA Workers 3.0
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8.0 h/day	TRA Workers 3.0
Technical and organisational conditions and measures	
• General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%]	TRA Workers 3.0
• Occupational Health and Safety Management System: Advanced	TRA Workers 3.0
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%]	TRA Workers 3.0
Conditions and measures related to personal protection, hygiene and health evaluation	
• Respiratory protection: Yes (Respirator with APF of 10) [Effectiveness Inhalation: 90%]	TRA Workers 3.0
• Dermal protection: Yes (Chemically resistant gloves conforming to EN374 with basic employee training) and (other) appropriate dermal protection [Effectiveness Dermal: 90%]	TRA Workers 3.0
Other conditions affecting workers exposure	
• Place of use: Indoor	TRA Workers 3.0
• Operating temperature: <= 40.0 °C	TRA Workers 3.0

9.3.6.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.32. Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	2.962 mg/m³ (TRA Workers)	RCR = 0.336
Inhalation, local, long term	2.962 mg/m³ (TRA Workers)	
Inhalation, local, acute	11.85 mg/m³ (TRA Workers)	
Dermal, systemic, long term	1.371 mg/kg bw/day (TRA Workers)	RCR = 0.548
Dermal, local, long term	0.1 mg/cm² (TRA Workers)	
Dermal, local, acute	0.1 mg/cm² (TRA Workers)	
Combined routes, systemic, long-term		RCR = 0.884

Remarks on exposure dataset obtained with ECETOC TRA

The vapour pressure at operating temperature (40°C) used for the calculation is 370.7 Pa.

9.3.7. Worker CS 7: PROC 10: Roller application or brushing (PROC 10)

9.3.7.1. Conditions of use

	Method
Product (Article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 100.0 %	TRA Workers 3.0
• Physical form of the used product: Liquid	TRA Workers 3.0
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8.0 h/day	TRA Workers 3.0
Technical and organisational conditions and measures	
• General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%]	TRA Workers 3.0
• Occupational Health and Safety Management System: Advanced	TRA Workers 3.0
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%]	TRA Workers 3.0
Conditions and measures related to personal protection, hygiene and health evaluation	
• Respiratory protection: Yes (Respirator with APF of 20) [Effectiveness Inhalation: 95%]	TRA Workers 3.0
• Dermal protection: Yes (Chemically resistant gloves conforming to EN374 with specific activity training) and (other) appropriate dermal protection [Effectiveness Dermal: 95%]	TRA Workers 3.0
Other conditions affecting workers exposure	
• Place of use: Indoor	TRA Workers 3.0
• Operating temperature: <= 40.0 °C	TRA Workers 3.0

9.3.7.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.33. Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	2.962 mg/m³ (TRA Workers)	RCR = 0.336
Inhalation, local, long term	2.962 mg/m³ (TRA Workers)	
Inhalation, local, acute	11.85 mg/m³ (TRA Workers)	
Dermal, systemic, long term	1.372 mg/kg bw/day (TRA Workers)	RCR = 0.549
Dermal, local, long term	0.1 mg/cm² (TRA Workers)	
Dermal, local, acute	0.1 mg/cm² (TRA Workers)	
Combined routes, systemic, long-term		RCR = 0.885

Remarks on exposure dataset obtained with ECETOC TRA

The vapour pressure at operating temperature (40°C) used for the calculation is 370.7 Pa.

9.3.8. Worker CS 8: PROC 13: Treatment of articles by dipping and pouring (PROC 13)

9.3.8.1. Conditions of use

	Method
Product (Article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 100.0 %	TRA Workers 3.0
• Physical form of the used product: Liquid	TRA Workers 3.0
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8.0 h/day	TRA Workers 3.0
Technical and organisational conditions and measures	
• General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%]	TRA Workers 3.0
• Occupational Health and Safety Management System: Advanced	TRA Workers 3.0
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%]	TRA Workers 3.0
Conditions and measures related to personal protection, hygiene and health evaluation	
• Respiratory protection: Yes (Respirator with APF of 20) [Effectiveness Inhalation: 95%]	TRA Workers 3.0
• Dermal protection: Yes (Chemically resistant gloves conforming to EN374 with basic employee training) and (other) appropriate dermal protection [Effectiveness Dermal: 90%]	TRA Workers 3.0
Other conditions affecting workers exposure	
• Place of use: Indoor	TRA Workers 3.0
• Operating temperature: <= 40.0 °C	TRA Workers 3.0

9.3.8.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.34. Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	2.962 mg/m³ (TRA Workers)	RCR = 0.336
Inhalation, local, long term	2.962 mg/m³ (TRA Workers)	

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, local, acute	11.85 mg/m³ (TRA Workers)	
Dermal, systemic, long term	1.371 mg/kg bw/day (TRA Workers)	RCR = 0.548
Dermal, local, long term	0.2 mg/cm² (TRA Workers)	
Dermal, local, acute	0.2 mg/cm² (TRA Workers)	
Combined routes, systemic, long-term		RCR = 0.884

Remarks on exposure dataset obtained with ECETOC TRA

The vapour pressure at operating temperature (40°C) used for the calculation is 370.7 Pa.

9.4. Exposure scenario 4: Widespread use by professional workers - Professional use of polishes and wax blends

Product category used: PC 31: Polishes and Wax Blends
Sector of use: SU 0: Other

Environment contributing scenario(s):		
CS 1	ERC 8a: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)	ERC 8a
Worker contributing scenario(s):		
CS 2	PROC 2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.	PROC 2
CS 3	PROC 8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities	PROC 8b
CS 4	PROC 10: Roller application or brushing	PROC 10
CS 5	PROC 11: Non industrial spraying	PROC 11

9.4.1. Env CS 1: ERC 8a: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC 8a)

9.4.1.1. Conditions of use

Amount used, frequency and duration of use (or from service life)
• Daily local widespread use amount: <= 0.00000055 tonnes/day
Conditions and measures related to biological sewage treatment plant
• Biological STP: Standard [Effectiveness Water: 88.74%]
Conditions and measures related to external treatment of waste (including article waste)
• Particular considerations on the waste treatment operations

9.4.1.2. Releases

The local releases to the environment are reported in the following table. Note that the releases reported do not account for the removal in the modelled biological STP.

Table 9.35. Local releases to the environment

Release	Release estimation method	Explanations
Water	ERC	**Release factor before on site RMM:** 100% **Release factor after on site RMM:** 100% **Local release rate:** 5.5E-4 kg/day
Air	ERC	**Release factor before on site RMM:** 100% **Release factor after on site RMM:** 100%
Non agricultural soil	ERC	**Release factor after on site RMM:** 0%

9.4.1.3. Exposure and risks for the environment and man via the environment

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table. The exposure estimates have been obtained with EUSES 2.1.2 unless stated otherwise.

Table 9.36. Exposure concentrations and risks for the environment and man via the environment

Protection target	Exposure concentration	Risk quantification

Protection target	Exposure concentration	Risk quantification
Fresh water	**Local PEC:** 8.07E-6 mg/L	RCR < 0.01
Sediment (freshwater)	**Local PEC:** 1.12E-3 mg/kg dw	RCR = 0.012
Marine water	**Local PEC:** 7.73E-7 mg/L	RCR < 0.01
Sediment (marine water)	**Local PEC:** 1.07E-4 mg/kg dw	RCR = 0.012
Agricultural soil	**Local PEC:** 9.09E-5 mg/kg dw	RCR < 0.01
Predator's prey (freshwater)	**Local PEC:** 2.45E-5 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Predator's prey (marine water)	**Local PEC:** 2.32E-6 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Top predator's prey (marine water)	**Local PEC:** 1.86E-6 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Predator's prey (terrestrial)	**Local PEC:** 2.24E-6 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Man via environment - Inhalation	**Concentration in air:** 2.47E-7 mg/m³	RCR < 0.01
Man via environment - Oral	**Exposure via food consumption:** 2.97E-7 mg/kg bw/day	RCR < 0.01
Man via environment - combined routes		RCR < 0.01

9.4.2. Worker CS 2: PROC 2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions. (PROC 2)

9.4.2.1. Conditions of use

	Method
Product (Article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 100.0 %	TRA Workers 3.0
• Physical form of the used product: Liquid	TRA Workers 3.0
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8.0 h/day	TRA Workers 3.0
Technical and organisational conditions and measures	
• General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%]	TRA Workers 3.0
• Occupational Health and Safety Management System: Basic	TRA Workers 3.0
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%]	TRA Workers 3.0
Conditions and measures related to personal protection, hygiene and health evaluation	
• Respiratory protection: Yes (Respirator with APF of 10) [Effectiveness Inhalation: 90%]	TRA Workers 3.0
• Dermal protection: No [Effectiveness Dermal: 0%]	TRA Workers 3.0

	Method
Other conditions affecting workers exposure	
• Place of use: Indoor	TRA Workers 3.0
• Operating temperature: <= 40.0 °C	TRA Workers 3.0

9.4.2.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.37. Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	2.962 mg/m³ (TRA Workers)	RCR = 0.336
Inhalation, local, long term	2.962 mg/m³ (TRA Workers)	
Inhalation, local, acute	11.85 mg/m³ (TRA Workers)	
Dermal, systemic, long term	1.37 mg/kg bw/day (TRA Workers)	RCR = 0.548
Dermal, local, long term	0.2 mg/cm² (TRA Workers)	
Dermal, local, acute	0.2 mg/cm² (TRA Workers)	
Combined routes, systemic, long-term		RCR = 0.884

Remarks on exposure dataset obtained with ECETOC TRA

The vapour pressure at operating temperature (40°C) used for the calculation is 370.7 Pa.

9.4.3. Worker CS 3: PROC 8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC 8b)

9.4.3.1. Conditions of use

	Method
Product (Article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 100.0 %	TRA Workers 3.0
• Physical form of the used product: Liquid	TRA Workers 3.0
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8.0 h/day	TRA Workers 3.0
Technical and organisational conditions and measures	
• General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%]	TRA Workers 3.0
• Occupational Health and Safety Management System: Basic	TRA Workers 3.0
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%]	TRA Workers 3.0
Conditions and measures related to personal protection, hygiene and health evaluation	
• Respiratory protection: Yes (Respirator with APF of 20) [Effectiveness Inhalation: 95%]	TRA Workers 3.0
• Dermal protection: Yes (Chemically resistant gloves conforming to EN374 with basic employee training) and (other) appropriate dermal protection [Effectiveness Dermal: 90%]	TRA Workers 3.0
Other conditions affecting workers exposure	
• Place of use: Indoor	TRA Workers 3.0
• Operating temperature: <= 40.0 °C	TRA Workers 3.0

9.4.3.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.38. Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	2.962 mg/m³ (TRA Workers)	RCR = 0.336
Inhalation, local, long term	2.962 mg/m³ (TRA Workers)	
Inhalation, local, acute	11.85 mg/m³ (TRA Workers)	
Dermal, systemic, long term	1.371 mg/kg bw/day (TRA Workers)	RCR = 0.548
Dermal, local, long term	0.1 mg/cm² (TRA Workers)	
Dermal, local, acute	0.1 mg/cm² (TRA Workers)	
Combined routes, systemic, long-term		RCR = 0.884

Remarks on exposure dataset obtained with ECETOC TRA

The vapour pressure at operating temperature (40°C) used for the calculation is 370.7 Pa.

9.4.4. Worker CS 4: PROC 10: Roller application or brushing (PROC 10)

9.4.4.1. Conditions of use

	Method
Product (Article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 5.0 %	TRA Workers 3.0
• Physical form of the used product: Liquid	TRA Workers 3.0
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8.0 h/day	TRA Workers 3.0
Technical and organisational conditions and measures	
• General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%]	TRA Workers 3.0
• Occupational Health and Safety Management System: Basic	TRA Workers 3.0
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%]	TRA Workers 3.0
Conditions and measures related to personal protection, hygiene and health evaluation	
• Respiratory protection: Yes (Respirator with APF of 20) [Effectiveness Inhalation: 95%]	TRA Workers 3.0
• Dermal protection: Yes (Chemically resistant gloves conforming to EN374 with basic employee training) and (other) appropriate dermal protection [Effectiveness Dermal: 90%]	TRA Workers 3.0
Other conditions affecting workers exposure	
• Place of use: Indoor	TRA Workers 3.0
• Operating temperature: <= 40.0 °C	TRA Workers 3.0

9.4.4.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.39. Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	1.481 mg/m³ (TRA Workers)	RCR = 0.168
Inhalation, local, long term	1.481 mg/m³ (TRA Workers)	
Inhalation, local, acute	5.925 mg/m³ (TRA Workers)	
Dermal, systemic, long term	0.549 mg/kg bw/day (TRA Workers)	RCR = 0.219
Dermal, local, long term	0.04 mg/cm² (TRA Workers)	
Dermal, local, acute	0.04 mg/cm² (TRA Workers)	
Combined routes, systemic, long-term		RCR = 0.387

Remarks on exposure dataset obtained with ECETOC TRA

The vapour pressure at operating temperature (40°C) used for the calculation is 370.7 Pa.

9.4.5. Worker CS 5: PROC 11: Non industrial spraying (PROC 11)

9.4.5.1. Conditions of use

	Method
Product (Article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 5.0 %	TRA Workers 3.0
• Physical form of the used product: Liquid	TRA Workers 3.0
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 4.0 h/day	TRA Workers 3.0
Technical and organisational conditions and measures	
• General ventilation: Enhanced general ventilation (5-10 air changes per hour) [Effectiveness Inhalation: 70%]	TRA Workers 3.0
• Occupational Health and Safety Management System: Basic	TRA Workers 3.0
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%]	TRA Workers 3.0
Conditions and measures related to personal protection, hygiene and health evaluation	
• Respiratory protection: Yes (Respirator with APF of 20) [Effectiveness Inhalation: 95%]	TRA Workers 3.0
• Dermal protection: Yes (Chemically resistant gloves conforming to EN374 with basic employee training) and (other) appropriate dermal protection [Effectiveness Dermal: 90%]	TRA Workers 3.0
Other conditions affecting workers exposure	
• Place of use: Indoor	TRA Workers 3.0
• Operating temperature: <= 40.0 °C	TRA Workers 3.0

9.4.5.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.40. Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	1.066 mg/m³ (TRA Workers)	RCR = 0.121
Inhalation, local, long term	1.066 mg/m³ (TRA Workers)	
Inhalation, local, acute	7.11 mg/m³ (TRA Workers)	

Route of exposure and type of effects	Exposure concentration	Risk quantification
Dermal, systemic, long term	2.143 mg/kg bw/day (TRA Workers)	RCR = 0.857
Dermal, local, long term	0.1 mg/cm² (TRA Workers)	
Dermal, local, acute	0.1 mg/cm² (TRA Workers)	
Combined routes, systemic, long-term		RCR = 0.978

Remarks on exposure dataset obtained with ECETOC TRA

The vapour pressure at operating temperature (40°C) used for the calculation is 370.7 Pa.

9.5. Exposure scenario 5: Widespread use by professional workers - Professional end-use of washing and cleaning products

Product category used: PC 35: Washing and Cleaning Products
Sector of use: SU 0: Other

Environment contributing scenario(s):		
CS 1	ERC 8a: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)	ERC 8a
Worker contributing scenario(s):		
CS 2	PROC 1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.	PROC 1
CS 3	PROC 2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.	PROC 2
CS 4	PROC 4: Chemical production where opportunity for exposure arises	PROC 4
CS 5	PROC 8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities	PROC 8a
CS 6	PROC 8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities	PROC 8b
CS 7	PROC 10: Roller application or brushing	PROC 10
CS 8	PROC 11: Non industrial spraying	PROC 11
CS 9	PROC 13: Treatment of articles by dipping and pouring	PROC 13

9.5.1. Env CS 1: ERC 8a: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC 8a)

9.5.1.1. Conditions of use

Amount used, frequency and duration of use (or from service life)
• Daily local widespread use amount: <= 0.00000055 tonnes/day
Conditions and measures related to biological sewage treatment plant
• Biological STP: Standard [Effectiveness Water: 88.74%]
Conditions and measures related to external treatment of waste (including article waste)
• Particular considerations on the waste treatment operations

9.5.1.2. Releases

The local releases to the environment are reported in the following table. Note that the releases reported do not account for the removal in the modelled biological STP.

Table 9.41. Local releases to the environment

Release	Release estimation method	Explanations
Water	ERC	**Release factor before on site RMM:** 100% **Release factor after on site RMM:** 100% **Local release rate:** 5.5E-4 kg/day
Air	ERC	**Release factor before on site RMM:** 100% **Release factor after on site RMM:** 100%
Non agricultural	ERC	**Release factor after on site RMM:** 0%

Release	Release estimation method	Explanations
soil		

9.5.1.3. Exposure and risks for the environment and man via the environment

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table. The exposure estimates have been obtained with EUSES 2.1.2 unless stated otherwise.

Table 9.42. Exposure concentrations and risks for the environment and man via the environment

Protection target	Exposure concentration	Risk quantification
Fresh water	**Local PEC:** 8.07E-6 mg/L	RCR < 0.01
Sediment (freshwater)	**Local PEC:** 1.12E-3 mg/kg dw	RCR = 0.012
Marine water	**Local PEC:** 7.73E-7 mg/L	RCR < 0.01
Sediment (marine water)	**Local PEC:** 1.07E-4 mg/kg dw	RCR = 0.012
Agricultural soil	**Local PEC:** 9.09E-5 mg/kg dw	RCR < 0.01
Predator's prey (freshwater)	**Local PEC:** 2.45E-5 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Predator's prey (marine water)	**Local PEC:** 2.32E-6 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Top predator's prey (marine water)	**Local PEC:** 1.86E-6 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Predator's prey (terrestrial)	**Local PEC:** 2.24E-6 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Man via environment - Inhalation	**Concentration in air:** 2.47E-7 mg/m³	RCR < 0.01
Man via environment - Oral	**Exposure via food consumption:** 2.97E-7 mg/kg bw/day	RCR < 0.01
Man via environment - combined routes		RCR < 0.01

9.5.2. Worker CS 2: PROC 1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions. (PROC 1)

9.5.2.1. Conditions of use

	Method
Product (Article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 100.0 %	TRA Workers 3.0
• Physical form of the used product: Liquid	TRA Workers 3.0
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8.0 h/day	TRA Workers 3.0
Technical and organisational conditions and measures	

	Method
• General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%]	TRA Workers 3.0
• Occupational Health and Safety Management System: Basic	TRA Workers 3.0
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%]	TRA Workers 3.0
Conditions and measures related to personal protection, hygiene and health evaluation	
• Respiratory protection: No [Effectiveness Inhalation: 0%]	TRA Workers 3.0
• Dermal protection: No [Effectiveness Dermal: 0%]	TRA Workers 3.0
Other conditions affecting workers exposure	
• Place of use: Indoor	TRA Workers 3.0
• Operating temperature: <= 40.0 °C	TRA Workers 3.0

9.5.2.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.43. Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	0.059 mg/m³ (TRA Workers)	RCR < 0.01
Inhalation, local, long term	0.059 mg/m³ (TRA Workers)	
Inhalation, local, acute	0.237 mg/m³ (TRA Workers)	
Dermal, systemic, long term	0.034 mg/kg bw/day (TRA Workers)	RCR = 0.014
Dermal, local, long term	9.92E-3 mg/cm² (TRA Workers)	
Dermal, local, acute	9.92E-3 mg/cm² (TRA Workers)	
Combined routes, systemic, long-term		RCR = 0.02

Remarks on exposure dataset obtained with ECETOC TRA

The vapour pressure at operating temperature (40°C) used for the calculation is 370.7 Pa.

9.5.3. Worker CS 3: PROC 2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions. (PROC 2)

9.5.3.1. Conditions of use

	Method
Product (Article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 100.0 %	TRA Workers 3.0
• Physical form of the used product: Liquid	TRA Workers 3.0
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8.0 h/day	TRA Workers 3.0
Technical and organisational conditions and measures	
• General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%]	TRA Workers 3.0
• Occupational Health and Safety Management System: Basic	TRA Workers 3.0
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%]	TRA Workers 3.0

	Method
Conditions and measures related to personal protection, hygiene and health evaluation	
• Respiratory protection: Yes (Respirator with APF of 10) [Effectiveness Inhalation: 90%]	TRA Workers 3.0
• Dermal protection: No [Effectiveness Dermal: 0%]	TRA Workers 3.0
Other conditions affecting workers exposure	
• Place of use: Indoor	TRA Workers 3.0
• Operating temperature: <= 40.0 °C	TRA Workers 3.0

9.5.3.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.44. Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	2.962 mg/m³ (TRA Workers)	RCR = 0.336
Inhalation, local, long term	2.962 mg/m³ (TRA Workers)	
Inhalation, local, acute	11.85 mg/m³ (TRA Workers)	
Dermal, systemic, long term	1.37 mg/kg bw/day (TRA Workers)	RCR = 0.548
Dermal, local, long term	0.2 mg/cm² (TRA Workers)	
Dermal, local, acute	0.2 mg/cm² (TRA Workers)	
Combined routes, systemic, long-term		RCR = 0.884

Remarks on exposure dataset obtained with ECETOC TRA

The vapour pressure at operating temperature (40°C) used for the calculation is 370.7 Pa.

9.5.4. Worker CS 4: PROC 4: Chemical production where opportunity for exposure arises (PROC 4)

9.5.4.1. Conditions of use

	Method
Product (Article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 100.0 %	TRA Workers 3.0
• Physical form of the used product: Liquid	TRA Workers 3.0
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8.0 h/day	TRA Workers 3.0
Technical and organisational conditions and measures	
• General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%]	TRA Workers 3.0
• Occupational Health and Safety Management System: Basic	TRA Workers 3.0
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%]	TRA Workers 3.0
Conditions and measures related to personal protection, hygiene and health evaluation	
• Respiratory protection: Yes (Respirator with APF of 10) [Effectiveness Inhalation: 90%]	TRA Workers 3.0
• Dermal protection: Yes (Chemically resistant gloves conforming to EN374 with basic employee training) and (other) appropriate dermal protection [Effectiveness Dermal:	TRA Workers 3.0

	Method
90%]	
Other conditions affecting workers exposure	
• Place of use: Indoor	TRA Workers 3.0
• Operating temperature: <= 40.0 °C	TRA Workers 3.0

9.5.4.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.45. Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	5.925 mg/m³ (TRA Workers)	RCR = 0.672
Inhalation, local, long term	5.925 mg/m³ (TRA Workers)	
Inhalation, local, acute	23.7 mg/m³ (TRA Workers)	
Dermal, systemic, long term	0.686 mg/kg bw/day (TRA Workers)	RCR = 0.274
Dermal, local, long term	0.1 mg/cm² (TRA Workers)	
Dermal, local, acute	0.1 mg/cm² (TRA Workers)	
Combined routes, systemic, long-term		RCR = 0.946

Remarks on exposure dataset obtained with ECETOC TRA

The vapour pressure at operating temperature (40°C) used for the calculation is 370.7 Pa.

9.5.5. Worker CS 5: PROC 8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC 8a)

9.5.5.1. Conditions of use

	Method
Product (Article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 10.0 %	TRA Workers 3.0
• Physical form of the used product: Liquid	TRA Workers 3.0
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8.0 h/day	TRA Workers 3.0
Technical and organisational conditions and measures	
• General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%]	TRA Workers 3.0
• Occupational Health and Safety Management System: Basic	TRA Workers 3.0
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%]	TRA Workers 3.0
Conditions and measures related to personal protection, hygiene and health evaluation	
• Respiratory protection: Yes (Respirator with APF of 20) [Effectiveness Inhalation: 95%]	TRA Workers 3.0
• Dermal protection: Yes (Chemically resistant gloves conforming to EN374 with basic employee training) and (other) appropriate dermal protection [Effectiveness Dermal: 90%]	TRA Workers 3.0
Other conditions affecting workers exposure	
• Place of use: Indoor	TRA Workers 3.0

	Method
• Operating temperature: <= 40.0 °C	TRA Workers 3.0

9.5.5.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.46. Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	4.444 mg/m³ (TRA Workers)	RCR = 0.504
Inhalation, local, long term	4.444 mg/m³ (TRA Workers)	
Inhalation, local, acute	17.77 mg/m³ (TRA Workers)	
Dermal, systemic, long term	0.823 mg/kg bw/day (TRA Workers)	RCR = 0.329
Dermal, local, long term	0.06 mg/cm² (TRA Workers)	
Dermal, local, acute	0.06 mg/cm² (TRA Workers)	
Combined routes, systemic, long-term		RCR = 0.833

Remarks on exposure dataset obtained with ECETOC TRA

The vapour pressure at operating temperature (40°C) used for the calculation is 370.7 Pa.

9.5.6. Worker CS 6: PROC 8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC 8b)

9.5.6.1. Conditions of use

	Method
Product (Article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 100.0 %	TRA Workers 3.0
• Physical form of the used product: Liquid	TRA Workers 3.0
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8.0 h/day	TRA Workers 3.0
Technical and organisational conditions and measures	
• General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%]	TRA Workers 3.0
• Occupational Health and Safety Management System: Basic	TRA Workers 3.0
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%]	TRA Workers 3.0
Conditions and measures related to personal protection, hygiene and health evaluation	
• Respiratory protection: Yes (Respirator with APF of 20) [Effectiveness Inhalation: 95%]	TRA Workers 3.0
• Dermal protection: Yes (Chemically resistant gloves conforming to EN374 with basic employee training) and (other) appropriate dermal protection [Effectiveness Dermal: 90%]	TRA Workers 3.0
Other conditions affecting workers exposure	
• Place of use: Indoor	TRA Workers 3.0
• Operating temperature: <= 40.0 °C	TRA Workers 3.0

9.5.6.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.47. Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	2.962 mg/m³ (TRA Workers)	RCR = 0.336
Inhalation, local, long term	2.962 mg/m³ (TRA Workers)	
Inhalation, local, acute	11.85 mg/m³ (TRA Workers)	
Dermal, systemic, long term	1.371 mg/kg bw/day (TRA Workers)	RCR = 0.548
Dermal, local, long term	0.1 mg/cm² (TRA Workers)	
Dermal, local, acute	0.1 mg/cm² (TRA Workers)	
Combined routes, systemic, long-term		RCR = 0.884

Remarks on exposure dataset obtained with ECETOC TRA

The vapour pressure at operating temperature (40°C) used for the calculation is 370.7 Pa.

9.5.7. Worker CS 7: PROC 10: Roller application or brushing (PROC 10)

9.5.7.1. Conditions of use

	Method
Product (Article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 5.0 %	TRA Workers 3.0
• Physical form of the used product: Liquid	TRA Workers 3.0
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8.0 h/day	TRA Workers 3.0
Technical and organisational conditions and measures	
• General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%]	TRA Workers 3.0
• Occupational Health and Safety Management System: Basic	TRA Workers 3.0
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%]	TRA Workers 3.0
Conditions and measures related to personal protection, hygiene and health evaluation	
• Respiratory protection: Yes (Respirator with APF of 20) [Effectiveness Inhalation: 95%]	TRA Workers 3.0
• Dermal protection: Yes (Chemically resistant gloves conforming to EN374 with basic employee training) and (other) appropriate dermal protection [Effectiveness Dermal: 90%]	TRA Workers 3.0
Other conditions affecting workers exposure	
• Place of use: Indoor	TRA Workers 3.0
• Operating temperature: <= 40.0 °C	TRA Workers 3.0

9.5.7.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.48. Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	1.481 mg/m³ (TRA Workers)	RCR = 0.168

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, local, long term	1.481 mg/m³ (TRA Workers)	
Inhalation, local, acute	5.925 mg/m³ (TRA Workers)	
Dermal, systemic, long term	0.549 mg/kg bw/day (TRA Workers)	RCR = 0.219
Dermal, local, long term	0.04 mg/cm² (TRA Workers)	
Dermal, local, acute	0.04 mg/cm² (TRA Workers)	
Combined routes, systemic, long-term		RCR = 0.387

Remarks on exposure dataset obtained with ECETOC TRA

The vapour pressure at operating temperature (40°C) used for the calculation is 370.7 Pa.

9.5.8. Worker CS 8: PROC 11: Non industrial spraying (PROC 11)

9.5.8.1. Conditions of use

	Method
Product (Article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 5.0 %	TRA Workers 3.0
• Physical form of the used product: Liquid	TRA Workers 3.0
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 4.0 h/day	TRA Workers 3.0
Technical and organisational conditions and measures	
• General ventilation: Enhanced general ventilation (5-10 air changes per hour) [Effectiveness Inhalation: 70%]	TRA Workers 3.0
• Occupational Health and Safety Management System: Basic	TRA Workers 3.0
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%]	TRA Workers 3.0
Conditions and measures related to personal protection, hygiene and health evaluation	
• Respiratory protection: Yes (Respirator with APF of 20) [Effectiveness Inhalation: 95%]	TRA Workers 3.0
• Dermal protection: Yes (Chemically resistant gloves conforming to EN374 with basic employee training) and (other) appropriate dermal protection [Effectiveness Dermal: 90%]	TRA Workers 3.0
Other conditions affecting workers exposure	
• Place of use: Indoor	TRA Workers 3.0
• Operating temperature: <= 40.0 °C	TRA Workers 3.0

9.5.8.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.49. Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	1.066 mg/m³ (TRA Workers)	RCR = 0.121
Inhalation, local, long term	1.066 mg/m³ (TRA Workers)	
Inhalation, local, acute	7.11 mg/m³ (TRA Workers)	
Dermal, systemic, long term	2.143 mg/kg bw/day (TRA Workers)	RCR = 0.857

Route of exposure and type of effects	Exposure concentration	Risk quantification
Dermal, local, long term	0.1 mg/cm² (TRA Workers)	
Dermal, local, acute	0.1 mg/cm² (TRA Workers)	
Combined routes, systemic, long-term		RCR = 0.978

Remarks on exposure dataset obtained with ECETOC TRA

The vapour pressure at operating temperature (40°C) used for the calculation is 370.7 Pa.

9.5.9. Worker CS 9: PROC 13: Treatment of articles by dipping and pouring (PROC 13)

9.5.9.1. Conditions of use

	Method
Product (Article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 100.0 %	TRA Workers 3.0
• Physical form of the used product: Liquid	TRA Workers 3.0
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8.0 h/day	TRA Workers 3.0
Technical and organisational conditions and measures	
• General ventilation: Good general ventilation (3-5 air changes per hour) [Effectiveness Inhalation: 30%]	TRA Workers 3.0
• Occupational Health and Safety Management System: Basic	TRA Workers 3.0
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%]	TRA Workers 3.0
Conditions and measures related to personal protection, hygiene and health evaluation	
• Respiratory protection: Yes (Respirator with APF of 20) [Effectiveness Inhalation: 95%]	TRA Workers 3.0
• Dermal protection: Yes (Chemically resistant gloves conforming to EN374 with basic employee training) and (other) appropriate dermal protection [Effectiveness Dermal: 90%]	TRA Workers 3.0
Other conditions affecting workers exposure	
• Place of use: Indoor	TRA Workers 3.0
• Operating temperature: <= 40.0 °C	TRA Workers 3.0

9.5.9.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.50. Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	2.074 mg/m³ (TRA Workers)	RCR = 0.235
Inhalation, local, long term	2.074 mg/m³ (TRA Workers)	
Inhalation, local, acute	8.295 mg/m³ (TRA Workers)	
Dermal, systemic, long term	1.371 mg/kg bw/day (TRA Workers)	RCR = 0.548
Dermal, local, long term	0.2 mg/cm² (TRA Workers)	
Dermal, local, acute	0.2 mg/cm² (TRA Workers)	

Route of exposure and type of effects	Exposure concentration	Risk quantification
Combined routes, systemic, long-term		RCR = 0.784

Remarks on exposure dataset obtained with ECETOC TRA

The vapour pressure at operating temperature (40°C) used for the calculation is 370.7 Pa.

9.6. Exposure scenario 6: Consumer use - Consumer (and Professional) end-use of cosmetics

Environment contributing scenario(s):		
CS 1	ERC 8a: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)	ERC 8a
Consumer contributing scenario(s):		
CS 2	PC 28: Perfumes, fragrances	PC 28
CS 3	PC 39: Cosmetics, personal care products	PC 39

9.6.1. Env CS 1: ERC 8a: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC 8a)

9.6.1.1. Conditions of use

Amount used, frequency and duration of use (or from service life)
• Daily local widespread use amount: <= 0.0000027 tonnes/day
Conditions and measures related to external treatment of waste (including article waste)
• Particular considerations on the waste treatment operations
Other conditions affecting environmental exposure
• Biological STP: Standard [Effectiveness Water: 88.74%]

9.6.1.2. Releases

The local releases to the environment are reported in the following table. Note that the releases reported do not account for the removal in the modelled biological STP.

Table 9.51. Local releases to the environment

Release	Release estimation method	Explanations
Water	ERC	**Release factor before on site RMM:** 100% **Release factor after on site RMM:** 100% **Local release rate:** 2.75E-3 kg/day
Air	ERC	**Release factor before on site RMM:** 100% **Release factor after on site RMM:** 100%
Non agricultural soil	ERC	**Release factor after on site RMM:** 0%

9.6.1.3. Exposure and risks for the environment and man via the environment

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table. The exposure estimates have been obtained with EUSES 2.1.2 unless stated otherwise.

Table 9.52. Exposure concentrations and risks for the environment and man via the environment

Protection target	Exposure concentration	Risk quantification
Fresh water	**Local PEC:** 2.04E-5 mg/L	RCR < 0.01
Sediment (freshwater)	**Local PEC:** 2.83E-3 mg/kg dw	RCR = 0.031
Marine water	**Local PEC:** 2.01E-6 mg/L	RCR < 0.01
Sediment (marine water)	**Local PEC:** 2.78E-4 mg/kg dw	RCR = 0.031
Agricultural soil	**Local PEC:** 4.47E-4 mg/kg dw	RCR < 0.01
Predator's prey (freshwater)	**Local PEC:** 4.77E-5 mg/kg ww	>>>**CAUTION:** Risk

Protection target	Exposure concentration	Risk quantification
		not controlled (based on qualitative risk characterisation) <<<
Predator's prey (marine water)	**Local PEC:** 4.65E-6 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Top predator's prey (marine water)	**Local PEC:** 2.32E-6 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Predator's prey (terrestrial)	**Local PEC:** 9.64E-6 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Man via environment - Inhalation	**Concentration in air:** 2.5E-7 mg/m³	RCR < 0.01
Man via environment - Oral	**Exposure via food consumption:** 7.57E-7 mg/kg bw/day	RCR < 0.01
Man via environment - combined routes		RCR < 0.01

9.6.2. Cons CS 2: PC 28: Perfumes, fragrances (PC 28)

9.6.2.1. Conditions of use

	Method
Product (article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 70.0 %	TRA Consumers 3.1 (R15)
• Physical form of the used product: Liquid	
• Exposure via inhalation route: Yes	TRA Consumers 3.1 (R15)
• Exposure via dermal route: Yes	TRA Consumers 3.1 (R15)
• Exposure via oral route: Yes	TRA Consumers 3.1 (R15)
• Spray: No	TRA Consumers 3.1 (R15)
Amount used (or contained in articles), frequency and duration of use/exposure	
• Amount of product used per application: <= 1.0 g/event	TRA Consumers 3.1 (R15)
• Exposure time per event: = 6.0 h/event	TRA Consumers 3.1 (R15)
• Frequency of use over a year: Frequent	TRA Consumers 3.1 (R15)
• Frequency of use over a day: = 1.0 events per day	TRA Consumers 3.1 (R15)
Information and behavioral advice for consumers	
• Adult/child assumed: Adult	TRA Consumers 3.1 (R15)

	Method
• Place of use: Indoor	TRA Consumers 3.1 (R15)
Other conditions affecting consumers exposure	
• Body parts potentially exposed: Hands	TRA Consumers 3.1 (R15)
• Inhalation transfer factor: = 0.01	TRA Consumers 3.1 (R15)
• Dermal transfer factor: = 0.01	TRA Consumers 3.1 (R15)
• Oral transfer factor: = 0.01	TRA Consumers 3.1 (R15)
• Volume of product swallowed: <= 1.0 cm3	TRA Consumers 3.1 (R15)

9.6.2.2. Exposure and risks for consumers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.53. Exposure concentrations and risks for consumers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	0.076 mg/m³ (TRA Consumers)	RCR = 0.035
Inhalation, local, long term	0.076 mg/m³ (TRA Consumers)	
Dermal, systemic, long term	1 mg/kg bw/day (TRA Consumers)	RCR = 0.8
Oral, systemic, long term	0.117 mg/kg bw/day (TRA Consumers)	RCR = 0.093
Combined routes, systemic, long-term		RCR = 0.929

Remarks on exposure dataset obtained with ECETOC TRA

9.6.3. Cons CS 3: PC 39: Cosmetics, personal care products (PC 39)

9.6.3.1. Conditions of use

	Method
Product (article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 70.0 %	TRA Consumers 3.1 (R15)
• Physical form of the used product: Liquid	
• Exposure via inhalation route: Yes	TRA Consumers 3.1 (R15)
• Exposure via dermal route: Yes	TRA Consumers 3.1 (R15)
• Exposure via oral route: Yes	TRA Consumers 3.1 (R15)
• Spray: No	TRA Consumers 3.1 (R15)
Amount used (or contained in articles), frequency and duration of use/exposure	
• Amount of product used per application: <= 1.0 g/event	TRA Consumers 3.1 (R15)

	Method
• Exposure time per event: = 6.0 h/event	TRA Consumers 3.1 (R15)
• Frequency of use over a year: Frequent	TRA Consumers 3.1 (R15)
• Frequency of use over a day: = 1.0 events per day	TRA Consumers 3.1 (R15)
Information and behavioral advice for consumers	
• Adult/child assumed: Adult	TRA Consumers 3.1 (R15)
• Place of use: Indoor	TRA Consumers 3.1 (R15)
Other conditions affecting consumers exposure	
• Body parts potentially exposed: Hands	TRA Consumers 3.1 (R15)
• Inhalation transfer factor: = 0.01	TRA Consumers 3.1 (R15)
• Dermal transfer factor: = 0.01	TRA Consumers 3.1 (R15)
• Oral transfer factor: = 0.01	TRA Consumers 3.1 (R15)
• Volume of product swallowed: <= 1.0 cm3	TRA Consumers 3.1 (R15)

9.6.3.2. Exposure and risks for consumers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.54. Exposure concentrations and risks for consumers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	0.076 mg/m³ (TRA Consumers)	RCR = 0.035
Inhalation, local, long term	0.076 mg/m³ (TRA Consumers)	
Dermal, systemic, long term	1 mg/kg bw/day (TRA Consumers)	RCR = 0.8
Oral, systemic, long term	0.117 mg/kg bw/day (TRA Consumers)	RCR = 0.093
Combined routes, systemic, long-term		RCR = 0.929

Remarks on exposure dataset obtained with ECETOC TRA

9.7. Exposure scenario 7: Consumer use - Consumer end-use of polishes and wax blends

Environment contributing scenario(s):		
CS 1	ERC 8a: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)	ERC 8a
Consumer contributing scenario(s):		
CS 2	PC 31: Polishes and wax blends	PC 31

9.7.1. Env CS 1: ERC 8a: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC 8a)

9.7.1.1. Conditions of use

Amount used, frequency and duration of use (or from service life)
• Daily local widespread use amount: <= 0.0000027 tonnes/day
Conditions and measures related to external treatment of waste (including article waste)
• Particular considerations on the waste treatment operations
Other conditions affecting environmental exposure
• Biological STP: Standard [Effectiveness Water: 88.74%]

9.7.1.2. Releases

The local releases to the environment are reported in the following table. Note that the releases reported do not account for the removal in the modelled biological STP.

Table 9.55. Local releases to the environment

Release	Release estimation method	Explanations
Water	ERC	**Release factor before on site RMM:** 100% **Release factor after on site RMM:** 100% **Local release rate:** 2.75E-3 kg/day
Air	ERC	**Release factor before on site RMM:** 100% **Release factor after on site RMM:** 100%
Non agricultural soil	ERC	**Release factor after on site RMM:** 0%

9.7.1.3. Exposure and risks for the environment and man via the environment

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table. The exposure estimates have been obtained with EUSES 2.1.2 unless stated otherwise.

Table 9.56. Exposure concentrations and risks for the environment and man via the environment

Protection target	Exposure concentration	Risk quantification
Fresh water	**Local PEC:** 2.04E-5 mg/L	RCR < 0.01
Sediment (freshwater)	**Local PEC:** 2.83E-3 mg/kg dw	RCR = 0.031
Marine water	**Local PEC:** 2.01E-6 mg/L	RCR < 0.01
Sediment (marine water)	**Local PEC:** 2.78E-4 mg/kg dw	RCR = 0.031
Agricultural soil	**Local PEC:** 4.47E-4 mg/kg dw	RCR < 0.01
Predator's prey (freshwater)	**Local PEC:** 4.77E-5 mg/kg ww	>>>**CAUTION:** Risk not controlled (based

Protection target	Exposure concentration	Risk quantification
		on qualitative risk characterisation) <<<
Predator's prey (marine water)	**Local PEC:** 4.65E-6 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Top predator's prey (marine water)	**Local PEC:** 2.32E-6 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Predator's prey (terrestrial)	**Local PEC:** 9.64E-6 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Man via environment - Inhalation	**Concentration in air:** 2.5E-7 mg/m³	RCR < 0.01
Man via environment - Oral	**Exposure via food consumption:** 7.57E-7 mg/kg bw/day	RCR < 0.01
Man via environment - combined routes		RCR < 0.01

9.7.2. Cons CS 2: PC 31: Polishes and wax blends (PC 31)

9.7.2.1. Conditions of use

	Method
Product (article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 70.0 %	TRA Consumers 3.1 (R15)
• Physical form of the used product: Liquid	
• Exposure via inhalation route: Yes	TRA Consumers 3.1 (R15)
• Exposure via dermal route: Yes	TRA Consumers 3.1 (R15)
• Exposure via oral route: Yes	TRA Consumers 3.1 (R15)
• Spray: No	TRA Consumers 3.1 (R15)
Amount used (or contained in articles), frequency and duration of use/exposure	
• Amount of product used per application: <= 1.0 g/event	TRA Consumers 3.1 (R15)
• Exposure time per event: = 6.0 h/event	TRA Consumers 3.1 (R15)
• Frequency of use over a year: Frequent	TRA Consumers 3.1 (R15)
• Frequency of use over a day: = 1.0 events per day	TRA Consumers 3.1 (R15)
Information and behavioral advice for consumers	
• Adult/child assumed: Adult	TRA Consumers 3.1 (R15)
• Place of use: Indoor	TRA Consumers 3.1

	Method
	(R15)
Other conditions affecting consumers exposure	
• Body parts potentially exposed: Hands	TRA Consumers 3.1 (R15)
• Inhalation transfer factor: = 0.01	TRA Consumers 3.1 (R15)
• Dermal transfer factor: = 0.01	TRA Consumers 3.1 (R15)
• Oral transfer factor: = 0.01	TRA Consumers 3.1 (R15)
• Volume of product swallowed: <= 1.0 cm3	TRA Consumers 3.1 (R15)

9.7.2.2. Exposure and risks for consumers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.57. Exposure concentrations and risks for consumers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	0.076 mg/m³ (TRA Consumers)	RCR = 0.035
Inhalation, local, long term	0.076 mg/m³ (TRA Consumers)	
Dermal, systemic, long term	1 mg/kg bw/day (TRA Consumers)	RCR = 0.8
Oral, systemic, long term	0.117 mg/kg bw/day (TRA Consumers)	RCR = 0.093
Combined routes, systemic, long-term		RCR = 0.929

Remarks on exposure dataset obtained with ECETOC TRA

9.8. Exposure scenario 8: Consumer use - Consumer end-use of air care products

Environment contributing scenario(s):		
CS 1	ERC 8a: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)	ERC 8a
Consumer contributing scenario(s):		
CS 2	PC 3: Air care products	PC 3

9.8.1. Env CS 1: ERC 8a: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC 8a)

9.8.1.1. Conditions of use

Amount used, frequency and duration of use (or from service life)
• Daily local widespread use amount: <= 0.0000027 tonnes/day
Conditions and measures related to external treatment of waste (including article waste)
• Particular considerations on the waste treatment operations
Other conditions affecting environmental exposure
• Biological STP: Standard [Effectiveness Water: 88.74%]

9.8.1.2. Releases

The local releases to the environment are reported in the following table. Note that the releases reported do not account for the removal in the modelled biological STP.

Table 9.58. Local releases to the environment

Release	Release estimation method	Explanations
Water	ERC	**Release factor before on site RMM:** 100% **Release factor after on site RMM:** 100% **Local release rate:** 2.75E-3 kg/day
Air	ERC	**Release factor before on site RMM:** 100% **Release factor after on site RMM:** 100%
Non agricultural soil	ERC	**Release factor after on site RMM:** 0%

9.8.1.3. Exposure and risks for the environment and man via the environment

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table. The exposure estimates have been obtained with EUSES 2.1.2 unless stated otherwise.

Table 9.59. Exposure concentrations and risks for the environment and man via the environment

Protection target	Exposure concentration	Risk quantification
Fresh water	**Local PEC:** 2.04E-5 mg/L	RCR < 0.01
Sediment (freshwater)	**Local PEC:** 2.83E-3 mg/kg dw	RCR = 0.031
Marine water	**Local PEC:** 2.01E-6 mg/L	RCR < 0.01
Sediment (marine water)	**Local PEC:** 2.78E-4 mg/kg dw	RCR = 0.031
Agricultural soil	**Local PEC:** 4.47E-4 mg/kg dw	RCR < 0.01
Predator's prey (freshwater)	**Local PEC:** 4.77E-5 mg/kg ww	>>>**CAUTION:** Risk not controlled (based

Protection target	Exposure concentration	Risk quantification
		on qualitative risk characterisation) <<<
Predator's prey (marine water)	**Local PEC:** 4.65E-6 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Top predator's prey (marine water)	**Local PEC:** 2.32E-6 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Predator's prey (terrestrial)	**Local PEC:** 9.64E-6 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Man via environment - Inhalation	**Concentration in air:** 2.5E-7 mg/m³	RCR < 0.01
Man via environment - Oral	**Exposure via food consumption:** 7.57E-7 mg/kg bw/day	RCR < 0.01
Man via environment - combined routes		RCR < 0.01

9.8.2. Cons CS 2: PC 3: Air care products (PC 3)

9.8.2.1. Conditions of use

	Method
Product (article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 70.0 %	TRA Consumers 3.1 (R15)
• Physical form of the used product: Liquid	
• Exposure via inhalation route: Yes	TRA Consumers 3.1 (R15)
• Exposure via dermal route: Yes	TRA Consumers 3.1 (R15)
• Exposure via oral route: Yes	TRA Consumers 3.1 (R15)
• Spray: No	TRA Consumers 3.1 (R15)
Amount used (or contained in articles), frequency and duration of use/exposure	
• Amount of product used per application: <= 1.0 g/event	TRA Consumers 3.1 (R15)
• Exposure time per event: = 6.0 h/event	TRA Consumers 3.1 (R15)
• Frequency of use over a year: Frequent	TRA Consumers 3.1 (R15)
• Frequency of use over a day: = 1.0 events per day	TRA Consumers 3.1 (R15)
Information and behavioral advice for consumers	
• Adult/child assumed: Adult	TRA Consumers 3.1 (R15)
• Place of use: Indoor	TRA Consumers 3.1

	Method
	(R15)
Other conditions affecting consumers exposure	
• Body parts potentially exposed: Hands	TRA Consumers 3.1 (R15)
• Inhalation transfer factor: = 0.01	TRA Consumers 3.1 (R15)
• Dermal transfer factor: = 0.01	TRA Consumers 3.1 (R15)
• Oral transfer factor: = 0.01	TRA Consumers 3.1 (R15)
• Volume of product swallowed: <= 1.0 cm3	TRA Consumers 3.1 (R15)

9.8.2.2. Exposure and risks for consumers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.60. Exposure concentrations and risks for consumers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	0.076 mg/m³ (TRA Consumers)	RCR = 0.035
Inhalation, local, long term	0.076 mg/m³ (TRA Consumers)	
Dermal, systemic, long term	1 mg/kg bw/day (TRA Consumers)	RCR = 0.8
Oral, systemic, long term	0.117 mg/kg bw/day (TRA Consumers)	RCR = 0.093
Combined routes, systemic, long-term		RCR = 0.929

Remarks on exposure dataset obtained with ECETOC TRA

9.9. Exposure scenario 9: Consumer use - Consumer end-use of washing and cleaning products

Environment contributing scenario(s):		
CS 1	ERC 8a: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)	ERC 8a
CS 2	ERC 8d: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)	ERC 8d
Consumer contributing scenario(s):		
CS 3	PC 35: Washing and cleaning products	PC 35

9.9.1. Env CS 1: ERC 8a: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC 8a)

9.9.1.1. Conditions of use

Amount used, frequency and duration of use (or from service life)
• Daily local widespread use amount: <= 0.0000027 tonnes/day
Conditions and measures related to external treatment of waste (including article waste)
• Particular considerations on the waste treatment operations
Other conditions affecting environmental exposure
• Biological STP: Standard [Effectiveness Water: 88.74%]

9.9.1.2. Releases

The local releases to the environment are reported in the following table. Note that the releases reported do not account for the removal in the modelled biological STP.

Table 9.61. Local releases to the environment

Release	Release estimation method	Explanations
Water	ERC	**Release factor before on site RMM:** 100% **Release factor after on site RMM:** 100% **Local release rate:** 2.75E-3 kg/day
Air	ERC	**Release factor before on site RMM:** 100% **Release factor after on site RMM:** 100%
Non agricultural soil	ERC	**Release factor after on site RMM:** 0%

9.9.1.3. Exposure and risks for the environment and man via the environment

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table. The exposure estimates have been obtained with EUSES 2.1.2 unless stated otherwise.

Table 9.62. Exposure concentrations and risks for the environment and man via the environment

Protection target	Exposure concentration	Risk quantification
Fresh water	**Local PEC:** 2.04E-5 mg/L	RCR < 0.01
Sediment (freshwater)	**Local PEC:** 2.83E-3 mg/kg dw	RCR = 0.031
Marine water	**Local PEC:** 2.01E-6 mg/L	RCR < 0.01
Sediment (marine water)	**Local PEC:** 2.78E-4 mg/kg dw	RCR = 0.031
Agricultural soil	**Local PEC:** 4.47E-4 mg/kg dw	RCR < 0.01

Protection target	Exposure concentration	Risk quantification
Predator's prey (freshwater)	**Local PEC:** 4.77E-5 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Predator's prey (marine water)	**Local PEC:** 4.65E-6 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Top predator's prey (marine water)	**Local PEC:** 2.32E-6 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Predator's prey (terrestrial)	**Local PEC:** 9.64E-6 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Man via environment - Inhalation	**Concentration in air:** 2.5E-7 mg/m³	RCR < 0.01
Man via environment - Oral	**Exposure via food consumption:** 7.57E-7 mg/kg bw/day	RCR < 0.01
Man via environment - combined routes		RCR < 0.01

9.9.2. Env CS 2: ERC 8d: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) (ERC 8d)

9.9.2.1. Conditions of use

Amount used, frequency and duration of use (or from service life)
• Daily local widespread use amount: <= 0.0000027 tonnes/day
Conditions and measures related to external treatment of waste (including article waste)
• Particular considerations on the waste treatment operations
Other conditions affecting environmental exposure
• Biological STP: Standard [Effectiveness Water: 88.74%]

9.9.2.2. Releases

The local releases to the environment are reported in the following table. Note that the releases reported do not account for the removal in the modelled biological STP.

Table 9.63. Local releases to the environment

Release	Release estimation method	Explanations
Water	ERC	**Release factor before on site RMM:** 100% **Release factor after on site RMM:** 100% **Local release rate:** 2.75E-3 kg/day
Air	ERC	**Release factor before on site RMM:** 100% **Release factor after on site RMM:** 100%
Non agricultural soil	ERC	**Release factor after on site RMM:** 20%

9.9.2.3. Exposure and risks for the environment and man via the environment

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table. The exposure estimates have been obtained with EUSES 2.1.2 unless stated otherwise.

Table 9.64. Exposure concentrations and risks for the environment and man via the environment

Protection target	Exposure concentration	Risk quantification
Fresh water	**Local PEC:** 2.04E-5 mg/L	RCR < 0.01
Sediment (freshwater)	**Local PEC:** 2.83E-3 mg/kg dw	RCR = 0.031
Marine water	**Local PEC:** 2.01E-6 mg/L	RCR < 0.01
Sediment (marine water)	**Local PEC:** 2.78E-4 mg/kg dw	RCR = 0.031
Agricultural soil	**Local PEC:** 4.47E-4 mg/kg dw	RCR < 0.01
Predator's prey (freshwater)	**Local PEC:** 4.77E-5 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Predator's prey (marine water)	**Local PEC:** 4.65E-6 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Top predator's prey (marine water)	**Local PEC:** 2.32E-6 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Predator's prey (terrestrial)	**Local PEC:** 9.64E-6 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Man via environment - Inhalation	**Concentration in air:** 2.5E-7 mg/m³	RCR < 0.01
Man via environment - Oral	**Exposure via food consumption:** 7.57E-7 mg/kg bw/day	RCR < 0.01
Man via environment - combined routes		RCR < 0.01

9.9.3. Cons CS 3: PC 35: Washing and cleaning products (PC 35)

9.9.3.1. Conditions of use

	Method
Product (article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 70.0 %	TRA Consumers 3.1 (R15)
• Physical form of the used product: Liquid	
• Exposure via inhalation route: Yes	TRA Consumers 3.1 (R15)
• Exposure via dermal route: Yes	TRA Consumers 3.1 (R15)
• Exposure via oral route: Yes	TRA Consumers 3.1 (R15)
• Spray: No	TRA Consumers 3.1 (R15)
Amount used (or contained in articles), frequency and duration of use/exposure	
• Amount of product used per application: <= 1.0 g/event	TRA Consumers 3.1 (R15)

	Method
• Exposure time per event: = 6.0 h/event	TRA Consumers 3.1 (R15)
• Frequency of use over a year: Frequent	TRA Consumers 3.1 (R15)
• Frequency of use over a day: = 1.0 events per day	TRA Consumers 3.1 (R15)
Information and behavioral advice for consumers	
• Adult/child assumed: Adult	TRA Consumers 3.1 (R15)
• Place of use: Indoor	TRA Consumers 3.1 (R15)
Other conditions affecting consumers exposure	
• Body parts potentially exposed: Hands	TRA Consumers 3.1 (R15)
• Inhalation transfer factor: = 0.01	TRA Consumers 3.1 (R15)
• Dermal transfer factor: = 0.01	TRA Consumers 3.1 (R15)
• Oral transfer factor: = 0.01	TRA Consumers 3.1 (R15)
• Volume of product swallowed: <= 1.0 cm3	TRA Consumers 3.1 (R15)

9.9.3.2. Exposure and risks for consumers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.65. Exposure concentrations and risks for consumers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	0.076 mg/m³ (TRA Consumers)	RCR = 0.035
Inhalation, local, long term	0.076 mg/m³ (TRA Consumers)	
Dermal, systemic, long term	1 mg/kg bw/day (TRA Consumers)	RCR = 0.8
Oral, systemic, long term	0.117 mg/kg bw/day (TRA Consumers)	RCR = 0.093
Combined routes, systemic, long-term		RCR = 0.929

Remarks on exposure dataset obtained with ECETOC TRA

9.10. Exposure scenario 10: Consumer use - Consumer end-use of biocides

Environment contributing scenario(s):		
CS 1	ERC 8a: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)	ERC 8a
CS 2	ERC 8d: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)	ERC 8d
Consumer contributing scenario(s):		
CS 3	PC 8: Biocidal products	PC 8

9.10.1. Env CS 1: ERC 8a: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC 8a)

9.10.1.1. Conditions of use

Amount used, frequency and duration of use (or from service life)
• Daily local widespread use amount: <= 0.0000027 tonnes/day
Conditions and measures related to external treatment of waste (including article waste)
• Particular considerations on the waste treatment operations
Other conditions affecting environmental exposure
• Biological STP: Standard [Effectiveness Water: 88.74%]

9.10.1.2. Releases

The local releases to the environment are reported in the following table. Note that the releases reported do not account for the removal in the modelled biological STP.

Table 9.66. Local releases to the environment

Release	Release estimation method	Explanations
Water	ERC	**Release factor before on site RMM:** 100% **Release factor after on site RMM:** 100% **Local release rate:** 2.75E-3 kg/day
Air	ERC	**Release factor before on site RMM:** 100% **Release factor after on site RMM:** 100%
Non agricultural soil	ERC	**Release factor after on site RMM:** 0%

9.10.1.3. Exposure and risks for the environment and man via the environment

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table. The exposure estimates have been obtained with EUSES 2.1.2 unless stated otherwise.

Table 9.67. Exposure concentrations and risks for the environment and man via the environment

Protection target	Exposure concentration	Risk quantification
Fresh water	**Local PEC:** 2.04E-5 mg/L	RCR < 0.01
Sediment (freshwater)	**Local PEC:** 2.83E-3 mg/kg dw	RCR = 0.031
Marine water	**Local PEC:** 2.01E-6 mg/L	RCR < 0.01
Sediment (marine water)	**Local PEC:** 2.78E-4 mg/kg dw	RCR = 0.031
Agricultural soil	**Local PEC:** 4.47E-4 mg/kg dw	RCR < 0.01

Protection target	Exposure concentration	Risk quantification
Predator's prey (freshwater)	**Local PEC:** 4.77E-5 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Predator's prey (marine water)	**Local PEC:** 4.65E-6 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Top predator's prey (marine water)	**Local PEC:** 2.32E-6 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Predator's prey (terrestrial)	**Local PEC:** 9.64E-6 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Man via environment - Inhalation	**Concentration in air:** 2.5E-7 mg/m³	RCR < 0.01
Man via environment - Oral	**Exposure via food consumption:** 7.57E-7 mg/kg bw/day	RCR < 0.01
Man via environment - combined routes		RCR < 0.01

9.10.2. Env CS 2: ERC 8d: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) (ERC 8d)

9.10.2.1. Conditions of use

Amount used, frequency and duration of use (or from service life)
• Daily local widespread use amount: <= 0.0000027 tonnes/day
Conditions and measures related to external treatment of waste (including article waste)
• Particular considerations on the waste treatment operations
Other conditions affecting environmental exposure
• Biological STP: Standard [Effectiveness Water: 88.74%]

9.10.2.2. Releases

The local releases to the environment are reported in the following table. Note that the releases reported do not account for the removal in the modelled biological STP.

Table 9.68. Local releases to the environment

Release	Release estimation method	Explanations
Water	ERC	**Release factor before on site RMM:** 100% **Release factor after on site RMM:** 100% **Local release rate:** 2.75E-3 kg/day
Air	ERC	**Release factor before on site RMM:** 100% **Release factor after on site RMM:** 100%
Non agricultural soil	ERC	**Release factor after on site RMM:** 20%

9.10.2.3. Exposure and risks for the environment and man via the environment

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table. The exposure estimates have been obtained with EUSES 2.1.2 unless stated otherwise.

Table 9.69. Exposure concentrations and risks for the environment and man via the environment

Protection target	Exposure concentration	Risk quantification
Fresh water	**Local PEC:** 2.04E-5 mg/L	RCR < 0.01
Sediment (freshwater)	**Local PEC:** 2.83E-3 mg/kg dw	RCR = 0.031
Marine water	**Local PEC:** 2.01E-6 mg/L	RCR < 0.01
Sediment (marine water)	**Local PEC:** 2.78E-4 mg/kg dw	RCR = 0.031
Agricultural soil	**Local PEC:** 4.47E-4 mg/kg dw	RCR < 0.01
Predator's prey (freshwater)	**Local PEC:** 4.77E-5 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Predator's prey (marine water)	**Local PEC:** 4.65E-6 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Top predator's prey (marine water)	**Local PEC:** 2.32E-6 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Predator's prey (terrestrial)	**Local PEC:** 9.64E-6 mg/kg ww	>>>**CAUTION:** Risk not controlled (based on qualitative risk characterisation) <<<
Man via environment - Inhalation	**Concentration in air:** 2.5E-7 mg/m³	RCR < 0.01
Man via environment - Oral	**Exposure via food consumption:** 7.57E-7 mg/kg bw/day	RCR < 0.01
Man via environment - combined routes		RCR < 0.01

9.10.3. Cons CS 3: PC 8: Biocidal products (PC 8)

9.10.3.1. Conditions of use

	Method
Product (article) characteristics	
• Percentage (w/w) of substance in mixture/article: <= 70.0 %	TRA Consumers 3.1 (R15)
• Physical form of the used product: Liquid	
• Exposure via inhalation route: Yes	TRA Consumers 3.1 (R15)
• Exposure via dermal route: Yes	TRA Consumers 3.1 (R15)
• Exposure via oral route: Yes	TRA Consumers 3.1 (R15)
• Spray: No	TRA Consumers 3.1 (R15)
Amount used (or contained in articles), frequency and duration of use/exposure	
• Amount of product used per application: <= 1.0 g/event	TRA Consumers 3.1 (R15)

	Method
• Exposure time per event: = 6.0 h/event	TRA Consumers 3.1 (R15)
• Frequency of use over a year: Frequent	TRA Consumers 3.1 (R15)
• Frequency of use over a day: = 1.0 events per day	TRA Consumers 3.1 (R15)
Information and behavioral advice for consumers	
• Adult/child assumed: Adult	TRA Consumers 3.1 (R15)
• Place of use: Indoor	TRA Consumers 3.1 (R15)
Other conditions affecting consumers exposure	
• Body parts potentially exposed: Hands	TRA Consumers 3.1 (R15)
• Inhalation transfer factor: = 0.01	TRA Consumers 3.1 (R15)
• Dermal transfer factor: = 0.01	TRA Consumers 3.1 (R15)
• Oral transfer factor: = 0.01	TRA Consumers 3.1 (R15)
• Volume of product swallowed: <= 1.0 cm3	TRA Consumers 3.1 (R15)

9.10.3.2. Exposure and risks for consumers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.70. Exposure concentrations and risks for consumers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	0.076 mg/m³ (TRA Consumers)	RCR = 0.035
Inhalation, local, long term	0.076 mg/m³ (TRA Consumers)	
Dermal, systemic, long term	1 mg/kg bw/day (TRA Consumers)	RCR = 0.8
Oral, systemic, long term	0.117 mg/kg bw/day (TRA Consumers)	RCR = 0.093
Combined routes, systemic, long-term		RCR = 0.929

Remarks on exposure dataset obtained with ECETOC TRA

10. RISK CHARACTERISATION RELATED TO COMBINED EXPOSURE

10.1. Human health

10.1.1. Workers

10.1.2. Consumer

10.2. Environment (combined for all emission sources)

10.2.1. All uses (regional scale)

10.2.1.1. Total releases

The total releases to the environment from all the exposure scenarios covered are presented in the table below. This is the sum of the releases to the environments from all exposure scenarios addressed.
Where there is more than one contributing scenario for the environment for a given exposure scenario, the highest release per route across all the contributing scenarios within the use has been taken into account as the release for the use (both for the regional and the exposure due to all the widespread uses). This may lead to overestimation of the PEC.

Table 10.1. Total releases to the environment per year from all life cycle stages

Release route	Total releases per year
Water	2.7E4 kg/year
Air	2.81E4 kg/year
Soil	2.05E3 kg/year

10.2.2. Regional assessment

The regional predicted environmental concentration (PEC regional) and the related risk characterisation ratios when a PNEC is available are presented in the table below. The exposure to man via the environment from regional exposure and the related risk characterisation ratios are also provided (when relevant). The exposure concentration for human via inhalation is equal to the PEC air.
The exposure estimates have been obtained with EUSES 2.1.2 unless stated otherwise.

Table 10.2. Predicted regional exposure concentrations (Regional PEC) and risks for the environment

Protection target	Regional PEC	Risk characterisation
Fresh water	**Regional PEC:** 4.98E-6 mg/L	RCR < 0.01
Sediment (freshwater)	**Regional PEC:** 6.94E-4 mg/kg dw	RCR < 0.01
Marine water	**Regional PEC:** 4.64E-7 mg/L	RCR < 0.01
Sediment (marine water)	**Regional PEC:** 4.62E-5 mg/kg dw	RCR < 0.01
Agricultural soil	**Regional PEC:** 1.79E-6 mg/kg dw	RCR < 0.01
Man via environment - Inhalation	**Concentration in air:** 2.46E-7 mg/m³	RCR < 0.01
Man via environment - Oral	**Exposure via food consumption:** 1.82E-7 mg/kg bw/day	RCR < 0.01
Man via environment - combined routes		RCR < 0.01

10.2.3. Local exposure due to all widespread uses

The predicted local environmental concentrations (PEC local) and the exposure to man via the environment (when relevant) based on the releases from all widespread uses are reported in the table below, when relevant, together with the risk characterisation ratio when a PNEC is available. The exposure estimates have been obtained with EUSES 2.1.2 unless stated otherwise.

Table 10.3. Predicted exposure concentrations and risks for the environment and man via the environment due to all widespread uses

Protection target	PEC local due to all widespread uses	Risk characterisation
Fresh water	**PEC:** 8.84E-5 mg/L	RCR = 0.029
Sediment (freshwater)	**PEC:** 0.012 mg/kg dw	RCR = 0.136
Marine water	**PEC:** 8.81E-6 mg/L	RCR = 0.029
Sediment (marine water)	**PEC:** 1.22E-3 mg/kg dw	RCR = 0.136
Agricultural soil	**PEC:** 2.41E-3 mg/kg dw	RCR = 0.034
Predator's prey (freshwater)	**PEC:** 1.75E-4 mg/kg ww	
Predator's prey (marine water)	**PEC:** 1.74E-5 mg/kg ww	
Top predator's prey (marine water)	**PEC:** 4.88E-6 mg/kg ww	
Predator's prey (terrestrial)	**PEC:** 5.04E-5 mg/kg ww	
Man via environment - Inhalation	**PEC:** 2.7E-7 mg/m³	RCR < 0.01
Man via environment - Oral	**PEC:** 3.29E-6 mg/kg bw/day	RCR < 0.01
Man via environment - combined routes		RCR < 0.01