

# SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006



**Ethyllinalool**

**5011728**

Version 4.0

Revision Date 18.11.2019

Date of last issue: 02.10.2014

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

### 1.1 Product identifier

Trade name : Ethyllinalool

REACH Registration Number : 01-2119969272-32-0000

Substance name : 3,7-dimethylnona-1,6-dien-3-ol

CAS-No. : 10339-55-6

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

Use of the Sub-  
stance/Mixture : Ingredient for fragrances

### 1.3 Details of the supplier of the safety data sheet

Company : DSM Nutritional Products Ltd.  
PO Box 2676  
CH-4002 Basel

Telephone : +41618158888

E-mail address of person  
responsible for the SDS : sds.nutritionalproducts@dsm.com

### 1.4 Emergency telephone number

+41 848 00 11 77 (Carechem 24 International)

## SECTION 2: Hazards identification

### 2.1 Classification of the substance or mixture

#### Classification (REGULATION (EC) No 1272/2008)


Skin irritation, Category 2 H315: Causes skin irritation.

Eye irritation, Category 2 H319: Causes serious eye irritation.

|| Skin sensitisation, Sub-category 1B H317: May cause an allergic skin reaction.

### 2.2 Label elements

#### Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms : 

Signal word : Warning

Hazard statements : H315 Causes skin irritation.  
H317 May cause an allergic skin reaction.  
H319 Causes serious eye irritation.

Precautionary statements : **Prevention:**  
P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.  
P264 Wash skin thoroughly after handling.  
P280 Wear protective gloves/ eye protection/ face protection.

**Response:**  
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.  
P337 + P313 If eye irritation persists: Get medical advice/ attention.

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P362 + P364

Take off contaminated clothing and wash it before reuse.

### 2.3 Other hazards

None known.

## SECTION 3: Composition/information on ingredients

Synonyms : 1,6-Nonadien-3-ol, 3,7-dimethyl-ELL

Brief description of the product : Substance

Molecular formula : C<sub>11</sub>-H<sub>20</sub>-O

### 3.1 Substances

#### Hazardous components

Chemical name	CAS-No. EC-No.	Concentration (% w/w)
3,7-dimethylnona-1,6-dien-3-ol	10339-55-6 233-732-6	>= 90 - <= 100

## SECTION 4: First aid measures

### 4.1 Description of first aid measures

General advice : Move out of dangerous area.  
Show this safety data sheet to the doctor in attendance.

If inhaled : Move to fresh air.  
Consult a physician after significant exposure.

In case of skin contact : Take off contaminated clothing and shoes immediately.  
Wash off with soap and plenty of water.  
If symptoms persist, call a physician.

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

If swallowed : Rinse mouth with water.  
Do not give milk or alcoholic beverages.  
Never give anything by mouth to an unconscious person.  
Obtain medical attention.

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

Symptoms : No specific symptoms known.

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

Treatment : Treat symptomatically.

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### 5.1 Extinguishing media

Suitable extinguishing media : Alcohol-resistant foam  
Dry chemical  
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media : High volume water jet

### 5.2 Special hazards arising from the substance or mixture

Specific hazards during fire-fighting : None known.

### 5.3 Advice for firefighters

Special protective equipment for firefighters : In the event of fire, wear self-contained breathing apparatus.

Further information : Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

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## SECTION 6: Accidental release measures

### 6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Use personal protective equipment.  
Ensure adequate ventilation.

### 6.2 Environmental precautions

Environmental precautions : Try to prevent the material from entering drains or water courses.

### 6.3 Methods and material for containment and cleaning up

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

### 6.4 Reference to other sections

For personal protection see section 8.

For disposal considerations see section 13.

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## SECTION 7: Handling and storage

### 7.1 Precautions for safe handling

Advice on safe handling : Ensure material transfers are under containment or extract ventilation.  
Ensure adequate ventilation, especially in confined areas.

Avoid contact with skin and eyes.  
For personal protection see section 8.  
Smoking, eating and drinking should be prohibited in the application area.

Advice on protection against fire and explosion : Take necessary action to avoid static electricity discharge.  
Product will burn under fire conditions.

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Hygiene measures : Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of work-day.

### 7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : To maintain product quality, do not store in heat or direct sunlight.

Keep container tightly closed and dry.

### 7.3 Specific end use(s)

Specific use(s) : Not applicable

## SECTION 8: Exposure controls/personal protection

### 8.1 Control parameters

Contains no substances with occupational exposure limit values.

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

Substance name	End Use	Exposure routes	Potential health effects	Value
3,7-dimethylnona-1,6-dien-3-ol	Workers	Inhalation	Long-term systemic effects	3 mg/m3
	Workers	Inhalation	Acute systemic effects	18 mg/m3
	Workers	Skin contact	Long-term systemic effects	2.7 mg/kg bw/d
	Workers	Skin contact	Long-term local effects	1.6 mg/cm2
	Workers	Skin contact	Acute local effects	1.6 mg/cm2
	Workers	Skin contact	Acute systemic effects	5.5 mg/kg bw/d
	Consumers	Inhalation	Acute systemic effects	4.4 mg/m3
	Consumers	Skin contact	Long-term systemic effects	1.4 mg/kg bw/d
	Consumer use	Skin contact	Long-term local effects	1.6 mg/cm2
	Consumer use	Skin contact	Acute local effects	1.6 mg/cm2
	Consumer use	Skin contact		2.7 mg/kg bw/d
	Consumer use	Ingestion	Long-term systemic effects	0.2 mg/kg bw/d

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

Substance name	Environmental Compartment	Value
3,7-dimethylnona-1,6-dien-3-ol	Fresh water	0.023 mg/l
	Marine water	0.002 mg/l
	Sewage treatment plant	10 mg/l
	Fresh water sediment	0.223 mg/kg dry weight
	Marine sediment	0.022 mg/kg dry weight
	Soil	0.031 mg/kg dry weight
	Predator's prey (freshwater)	8.53 mg/kg

### 8.2 Exposure controls

#### Personal protective equipment

Eye protection : Safety glasses with side-shields

Hand protection

Material

: for example nitrile rubber  
: Consider the hazard characteristics of this product and any special workplace conditions when selecting the appropriate type of protective gloves.

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- |                          |  |
|--------------------------|--|
| Skin and body protection | : Choose body protection according to the amount and concentration of the dangerous substance at the work place. |
| Respiratory protection   | : In the case of vapour formation use a respirator with an approved filter.                                      |
|                          | Wear respiratory protection when its use is identified for certain contributing scenario.                        |

## SECTION 9: Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

- |  |   |
|--|---|
| Appearance                             | : clear liquid  |
| Colour                                 | : colourless - pale yellow  |
| Odour                                  | : fresh, floral   |
| Odour Threshold                        | : No information available.   |
| pH                                     | : No data available   |
| Melting point/range                    | : < -73 °C (OECD Test Guideline 102)  |
| Boiling point/boiling range            | : 215 °C (1,013 hPa)  |
| Flash point                            | : 87 °C (1,013 hPa, ISO 13736)  |
| Evaporation rate                       | : not determined  |
| Flammability (solid, gas)              | : The substance or mixture does not emit flammable gases in contact with water.                             |
| Lower explosion limit                  | : not determined  |
| Upper explosion limit                  | : not determined  |
| Vapour pressure                        | : 0.07 hPa (15 °C; OECD Test Guideline 104)<br>0.18 hPa (25 °C; OECD Test Guideline 104)<br>48 hPa (122 °C) |
| Relative vapour density                | : not determined  |
| Density                                | : 0.862 g/cm <sup>3</sup> (20 °C; OECD Test Guideline 109)  |
| Water solubility                       | : 0.656 g/l (20 °C, pH 6.14; OECD Test Guideline 105)<br>slightly soluble                                   |
| Solubility in other solvents           | : various organic solvents: soluble   |
| Partition coefficient: n-octanol/water | : log Pow 3.3 (20 °C; OECD Test Guideline 107)  |
| Auto-ignition temperature              | : not pyrophoric  |
| Ignition temperature                   | : 250 °C (1,013 hPa, DIN 51794)   |
| Thermal decomposition                  | : Decomposes on heating.<br>Violent runaway reaction can occur.   |
| Viscosity, dynamic                     | : ca. 7.3 mPa.s (20 °C)   |
| Explosive properties                   | : Not explosive   |
| Oxidizing properties                   | : Not oxidizing   |

### 9.2 Other information

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Refractive index	: 1.462 - 1.466 (589 nm, 20 °C)
Molecular weight	: 168.28 g/mol
Surface tension	: 27.8 mN/m (20 °C, OECD Test Guideline 115)

### SECTION 10: Stability and reactivity

#### 10.1 Reactivity

No hazards to be specially mentioned.

#### 10.2 Chemical stability

Stable under recommended storage conditions.

#### 10.3 Possibility of hazardous reactions

Possible incompatibility with materials listed under section 10.5.

#### 10.4 Conditions to avoid

Heat  
Exposure to air.

#### 10.5 Incompatible materials

Acids and bases  
Oxidizing agents

#### 10.6 Hazardous decomposition products

Peroxides  
Carbon monoxide, carbon dioxide and unburned hydrocarbons (smoke).

### SECTION 11: Toxicological information

#### 11.1 Information on toxicological effects

Acute oral toxicity	: LD50 (Rat): ca. 5,280 mg/kg
Acute dermal toxicity	: LD50 (Rabbit): > 5,000 mg/kg
Skin irritation	: Irritating to skin. (In vitro study, EPISKIN Human Skin Model Test)
Eye irritation	: Eye irritation (Rabbit)
Sensitisation	: The product is a skin sensitizer, sub-category 1B. (Mouse, Local Lymph Node Assay (LLNA), OECD Test Guideline 429)
Genotoxicity in vitro	: not mutagenic (Ames test, OECD Test Guideline 471) : not genotoxic (Chromosome aberration test in vitro, OECD Test Guideline 473) Test performed using a similar product. : not genotoxic (In vitro gene mutation study in mammalian cells,

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	OECD Test Guideline 476) Test performed using a similar product.
Genotoxicity in vivo	: not genotoxic (Mutagenicity (micronucleus test), Mouse, Oral, OECD Test Guideline 474) Test performed using a similar product.
Carcinogenicity	: This information is not available.
Reproductive toxicity	: Test performed using a similar product. NOAEL: 200 mg/kg bw/d (Rat, females, Oral, OECD Test Guideline 421)
Teratogenicity	: Test performed using a similar product. NOAEL: 1,000 mg/kg body weight (Rat, Oral)
STOT - single exposure (Acute exposure)	: The substance or mixture is not classified as specific target organ toxicant, single exposure.
STOT - repeated exposure	: NOAEL (Oral, Rat, male and female) : 160 mg/kg bw/d Subacute toxicity study (28 days) Test performed using a similar product. (OECD Test Guideline 407) : NOAEL (Dermal, Rat, male and female) : 250 mg/kg bw/d Sub-chronic toxicity study (90-day) Test performed using a similar product. (OECD Test Guideline 411)
Further information	: May cause irritation of respiratory tract.
Aspiration toxicity	: No aspiration toxicity classification

## SECTION 12: Ecological information

### 12.1 Toxicity

Toxicity to fish	: Danio rerio (zebra fish) LC50 (96 h) 24 mg/l (OECD Test Guideline 203)
Toxicity to daphnia and other aquatic invertebrates	: Daphnia magna (Water flea) EC50 (48 h) 23 mg/l (OECD Test Guideline 202)
Toxicity to algae	: Desmodesmus subspicatus (green algae) ErC50 (72 h) 25.1 mg/l (OECD Test Guideline 201) : Desmodesmus subspicatus (green algae) NOEC (72 h) 6.3 mg/l (OECD Test Guideline 201)

### 12.2 Persistence and degradability

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Biodegradability : Readily biodegradable.  
91 % (28 d)  
(OECD Test Guideline 301C)

### 12.3 Bioaccumulative potential

Partition coefficient: n-octanol/water : log Pow 3.3 ( 20 °C ; OECD Test Guideline 107)

### 12.4 Mobility in soil

Distribution among environmental compartments : No data available

Surface tension : 27.8 mN/m ( 20 °C, OECD Test Guideline 115)

### 12.5 Results of PBT and vPvB assessment

Assessment : The substance does not fulfill the PBT criteria.  
: The substance does not fulfill the vPvB criteria.

### 12.6 Other adverse effects

Additional ecological information : Harmful to aquatic organisms.

## SECTION 13: Disposal considerations

### 13.1 Waste treatment methods

Product : Discharge into the environment must be avoided.  
Do not contaminate ponds, waterways or ditches with chemical or used container.  
Do not dispose of waste into sewer.  
Offer surplus and non-recyclable solutions to a licensed disposal company.

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

## SECTION 14: Transport information

### 14.1 UN number

Not regulated as a dangerous good

### 14.2 UN proper shipping name

Not regulated as a dangerous good

### 14.3 Transport hazard class(es)

Not regulated as a dangerous good

### 14.4 Packing group

Not regulated as a dangerous good

### 14.5 Environmental hazards

Not regulated as a dangerous good

### 14.6 Special precautions for user



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Remarks : Not classified as dangerous in the meaning of transport regulations.

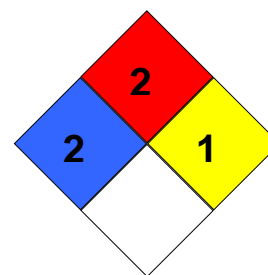
### 14.7 Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable for product as supplied.

## SECTION 15: Regulatory information

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

**NFPA Classification** : Health hazard: 2  
Fire Hazard: 2  
Reactivity Hazard: 1



### 15.2 Chemical safety assessment

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

## SECTION 16: Other information

### Full text of other abbreviations

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road; AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - Substance of Very High Concern; TCSI - Taiwan Chemical Substance Inven-

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tory; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

DNEL - Derived No-Effect Level; NFPA - National Fire Protection Association (USA); PNEC - Predicted No-Effect Concentration; STEL - Short term exposure limit; TLV-C - Ceiling Limit Value; TWA - Time Weighted Average; WEL - Workplace Exposure Limit.

### Further information

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

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### Annex

	Title of Exposure Scenario
ES 1:	Compounding of fragrance oils (large/medium sites)
ES 2:	Compounding of fragrance oils (small sites)
ES 3:	Formulation of Cosmetics: low viscosity liquids (Shampoo, hair conditioner, shower gel, foam bath) (large scale), body care soap (medium and large scale) Cosmetics Europe / COLIPA
ES 4:	Formulation of Cosmetics: low viscosity liquids (Shampoo, hair conditioner, shower gel, foam bath) (medium scale), body care soap (medium scale) Cosmetics Europe / COLIPA
ES 5:	Formulation of Cosmetics: low viscosity liquids (Shampoo, hair conditioner, shower gel, foam bath) (small scale) Cosmetics Europe / COLIPA
ES 6:	Formulation of Cosmetics: Medium Viscosity Body Care Products (medium scale), Non-liquid Creams (skin care, body care, mascara, solar oil, make-up foundation) (large scale) Cosmetics Europe / COLIPA
ES 7:	Formulation of Cosmetics: Non-liquid Creams (skin care, body care, mascara, solar oil, make-up foundation) (small scale) Cosmetics Europe / COLIPA
ES 8:	Cosmetics Europe / COLIPA Formulation of Cosmetics: Fine Fragrances - Cleaning with Water (medium scale), Medium Viscosity Body Care Products (small scale), Non-liquid Creams (skin care, body care, mascara, solar oil, make-up foundation) (medium scale)
ES 9:	Cosmetics Europe / COLIPA Formulation of Cosmetics: Fine Fragrances - Cleaning with Water (small scale)
ES 10:	Cosmetics Europe / COLIPA Formulation of cosmetic products involving cleaning with Organic Solvents (Varnish / Removers, Decorative Cosmetics, Spray, Lacquer, Fine Fragrance, Solar oil, solid products)
ES 11:	Cosmetics Europe / COLIPA Formulation of body care soap (small scale)
ES 12:	Formulation of Detergents/Maintenance Products: Granular Regular (large scale), Granular Compact (small scale), Low Viscosity Liquids (large scale) (AISE)
ES 13:	(AISE) Formulation of Detergents/Maintenance Products: High Viscosity Liquids (medium scale) Formulation of liquid Detergents/Maintenance Products: High Viscosity (large scale)
ES 14:	(AISE) Formulation of Detergents/Maintenance Products: High Viscosity Liquids (medium scale)
ES 15:	(AISE) Formulation of Detergents/Maintenance Products: High Viscosity Liquids (small scale)
ES 16:	(AISE) Formulation of Detergents/Maintenance Products: Granular Compact (large scale)
ES 17:	(AISE) Formulation of Detergents/Maintenance Products: Granular Compact (small scale)
ES 18:	(AISE) Formulation of Detergents/Maintenance Products: Granular Regular (small scale), Low Viscosity Liquids (small scale)
ES 19:	(AISE) Formulation of air care products
ES 20:	Formulation
ES 21:	(AISE) Industrial use of detergents and maintenance products / Indoor
ES 22:	(AISE) Industrial use of detergents and maintenance products / Outdoor
ES 23:	(AISE) Professional use in cleaning agents / Indoor
ES 24:	Professional outdoor use of detergents and maintenance products (AISE)
ES 25:	Professional use Polishes and wax blends (AISE)
ES 26:	Consumer Washing and cleaning products (including solvent based products) (AISE)
ES 27:	Consumer use of air care products (AISE)
ES 28:	Biocides (AISE)
ES 29:	Polishes and wax blends (AISE)
ES 30:	Consumer use of cosmetics

### Abbreviations

ART = Advanced REACH Tool

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ECETOC TRA = European Centre for Ecotoxicology and Toxicology Of Chemicals - Targeted Risk Assessment

ES = Exposure scenario

EUSES = European Union System for the Evaluation of Substances

PEC = Predicted exposure concentration

RCR = Risk characterisation ratio: "Level of Exposure/DNEL" or "PEC/PNEC"

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## ES 1: Compounding of fragrance oils (large/medium sites)

### 1. Scenario description

Main User Groups	: <b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites
Chemical product category	: <b>PC28:</b> Perfumes, fragrances
Process categories	: <b>PROC1:</b> Use in closed process, no likelihood of exposure <b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure <b>PROC3:</b> Use in closed batch process (synthesis or formulation) <b>PROC5:</b> Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) <b>PROC8a:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities <b>PROC8b:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities <b>PROC9:</b> Transfer of substance or preparation into small containers (dedicated filling line, including weighing) <b>PROC15:</b> Use as laboratory reagent
Environmental Release Categories	: <b>ERC2:</b> Formulation of preparations

### 2.1 Contributing scenario controlling environmental exposure for: ERC2

#### Product characteristics

Viscosity, dynamic	: 7.28 mPa.s (at 20 °C)
Annual amount per site (Msafe)	: 434 t
Remarks	: Msafe is the maximum amount of substance or product which may be used safely under the conditions defined in the environmental part of the exposure scenario.

#### Frequency and duration of use

Continuous exposure	: 250 days/year
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#### Environment factors not influenced by risk management

Flow rate of receiving surface water	: 18,000 m <sup>3</sup> /d
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#### Other given operational conditions affecting environmental exposure

Emission or Release Factor: Air	: 2.5 %
Emission or Release Factor: Water	: 0.2 %
Emission or Release Factor: Soil	: 0.0 %

#### Technical conditions and measures / Organizational measures

Water	: All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.
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#### Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant	: Municipal sewage treatment plant
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Flow rate of sewage treatment plant effluent	: 2,000 m3/d
Effectiveness (of a measure)	: 87.7 %
Sludge Treatment	: Can be applied on agricultural soil, when in compliance with local regulations.

### Conditions and measures related to external treatment of waste for disposal

Disposal methods : Dispose of as hazardous waste in compliance with local and national regulations.

## 2.2 Contributing scenario controlling worker exposure for: PROC1, Liquid substance

### Product characteristics

Concentration of the Substance in Mixture/Article	: Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	: Liquid substance

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## 2.3 Contributing scenario controlling worker exposure for: PROC2, Liquid substance

### Product characteristics

Concentration of the Substance in Mixture/Article	: Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	: Liquid substance

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.4 Contributing scenario controlling worker exposure for: PROC2, PROC15, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article	: Covers the percentage of the substance in the product up to 25 %.
Physical Form (at time of use)	: Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

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## 2.5 Contributing scenario controlling worker exposure for: PROC3, Liquid substance

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).  
Physical Form (at time of use) : Liquid substance

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.6 Contributing scenario controlling worker exposure for: PROC5, Liquid substance

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).  
Physical Form (at time of use) : Liquid substance

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide appropriate exhaust ventilation at machinery. (Effectiveness (of a measure): 90 %)

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)  
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
(Effectiveness (of a measure): 90 %)

## 2.7 Contributing scenario controlling worker exposure for: PROC8b, Liquid substance

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).  
Physical Form (at time of use) : Liquid substance

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide appropriate exhaust ventilation at machinery. (Effectiveness (of a measure): 95 %)  
Provide enhanced general ventilation by mechanical means. (Effectiveness (of a measure): 30 %)

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## Conditions and measures related to personal protection, hygiene and health evaluation

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
(Effectiveness (of a measure): 90 %)

## 2.8 Contributing scenario controlling worker exposure for: PROC8a, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide appropriate exhaust ventilation at machinery. (Effectiveness (of a measure): 90 %)

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)  
Wear suitable gloves tested to EN374. (Effectiveness (of a measure): 80 %)

## 2.9 Contributing scenario controlling worker exposure for: PROC8b, Liquid mixture

Activity : Loading and unloading

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide enhanced general ventilation by mechanical means. (Effectiveness (of a measure): 30 %)

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)  
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
(Effectiveness (of a measure): 90 %)

## 2.10 Contributing scenario controlling worker exposure for: PROC9, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Liquid mixture



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### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide enhanced general ventilation by mechanical means. (Effectiveness (of a measure): 30 %)

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear suitable gloves tested to EN374. (Effectiveness (of a measure): 80 %)

## 2.11 Contributing scenario controlling worker exposure for: PROC15, Liquid substance

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).  
Physical Form (at time of use) : Liquid substance

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide sufficient air exchange and/or exhaust in work rooms. (Effectiveness (of a measure): 30 %)

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 3. Exposure estimation and reference to its source

### Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure (PEC)	RCR
ERC2	EUSES		Fresh water		0.02 mg/l	0.74
			Fresh water sediment		0.17 mg/kg dry weight	0.75
			Marine water		0.002 mg/l	0.74
			Marine sediment		0.02 mg/kg dry weight	0.74
			Sewage treatment plant		0.17 mg/l	0.02
			Soil		0.02 mg/kg dry weight	0.76

### Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PROC1, Liquid sub-	TRA Workers	Worker (Indus-	Inhalation: long-term,	0.14 mg/m <sup>3</sup>	0.05

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stance	3.0	trial)	systemic		
PROC1	TRA Workers 3.0		Inhalation: short-term, systemic	0.28 mg/cm2	0.02
PROC1	TRA Workers 3.0		Dermal: long-term, systemic	0.005 mg/cm2	0.006
PROC1	TRA Workers 3.0		Chronic dermal local exposure	0.01 mg/cm2	< 0.01
PROC1	TRA Workers 3.0		Dermal: acute, local	0.01 mg/cm2	< 0.01
PROC2, Liquid sub- stance	TRA Workers 3.0	Worker (Indus- trial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC2	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/cm2	0.16
PROC2	TRA Workers 3.0		Dermal: long-term, systemic	1.37 mg/kg bw/day	0.51
PROC2	TRA Workers 3.0		Dermal: acute, local	0.2 mg/cm2	0.13
PROC2	TRA Workers 3.0		Chronic dermal local exposure	0.2 mg/cm2	0.13
PROC2, PROC15, Liquid mixture	TRA Workers 3.0	Worker (Indus- trial)	Inhalation: long-term, systemic	0.07 mg/m <sup>3</sup>	0.02
PROC2, PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	0.28 mg/m <sup>3</sup>	0.02
PROC2, PROC15	TRA Workers 3.0		Dermal: long-term, systemic	0.03 mg/cm2	0.01
PROC2, PROC15	TRA Workers 3.0		Chronic dermal local exposure	0.01 mg/cm2	0.01
PROC2, PROC15	TRA Workers 3.0		Dermal: acute, local	0.01 mg/cm2	0.01
PROC3, Liquid sub- stance	TRA Workers 3.0	Worker (Indus- trial)	Inhalation: long-term, systemic	2.1 mg/m <sup>3</sup>	0.70
PROC3	TRA Workers 3.0		Inhalation: short-term, systemic	8.4 mg/cm2	0.47
PROC3	TRA Workers 3.0		Dermal: long-term, systemic	0.69 mg/kg bw/day	0.26
PROC3	TRA Workers 3.0		Chronic dermal local exposure	0.20 mg/cm2	0.13
PROC3	TRA Workers 3.0		Dermal: acute, local	0.20 mg/cm2	0.13
PROC5, Liquid sub- stance	TRA Workers 3.0	Worker (Indus- trial)	Inhalation: long-term, systemic	0.35 mg/m <sup>3</sup>	0.12
PROC5	TRA Workers 3.0		Inhalation: short-term, systemic	1.40 mg/cm2	0.08
PROC5	TRA Workers 3.0		Dermal: long-term, systemic	1.37 mg/kg bw/day	0.51
PROC5	TRA Workers 3.0		Chronic dermal local exposure	0.2 mg/cm2	0.13
PROC5	TRA Workers 3.0		Dermal: acute, local	0.2 mg/cm2	0.13
PROC8b, Liquid sub- stance	TRA Workers 3.0	Worker (Indus- trial)	Inhalation: long-term, systemic	1.23 mg/m <sup>3</sup>	0.41
PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	4.91 mg/m <sup>3</sup>	0.27
PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	1.37 mg/cm2	0.51
PROC8b	TRA Workers 3.0		Dermal: acute, local	0.1 mg/cm2	0.06
PROC8b	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm2	0.06
PROC8a, Liquid mix- ture	TRA Workers 3.0	Worker (Indus- trial)	Inhalation: long-term, systemic	0.42 mg/m <sup>3</sup>	0.14
PROC8a	TRA Workers 3.0		Inhalation: short-term, systemic	1.68 mg/m <sup>3</sup>	0.09
PROC8a	TRA Workers		Dermal: long-term,	1.65 mg/cm2	0.61

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	3.0		systemic		
PROC8a	TRA Workers 3.0		Chronic dermal local exposure	0.12 mg/cm <sup>2</sup>	0.08
PROC8a	TRA Workers 3.0		Dermal: acute, local	0.12 mg/cm <sup>2</sup>	0.08
PROC8b, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.23 mg/m <sup>3</sup>	0.41
PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	4.91 mg/m <sup>3</sup>	0.27
PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	1.37 mg/cm <sup>2</sup>	0.51
PROC8b	TRA Workers 3.0		Dermal: acute, local	0.1 mg/cm <sup>2</sup>	0.06
PROC8b	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC9, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m <sup>3</sup>	0.49
PROC9	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m <sup>3</sup>	0.33
PROC9	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/cm <sup>2</sup>	0.31
PROC9	TRA Workers 3.0		Chronic dermal local exposure	0.12 mg/cm <sup>2</sup>	0.08
PROC9	TRA Workers 3.0		Dermal: acute, local	0.12 mg/cm <sup>2</sup>	0.08
PROC15, Liquid substance	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.45 mg/m <sup>3</sup>	0.82
PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/cm <sup>2</sup>	0.55
PROC15	TRA Workers 3.0		Dermal: long-term, systemic	0.34 mg/cm <sup>2</sup>	0.13
PROC15	TRA Workers 3.0		Chronic dermal local exposure	0.01 mg/cm <sup>2</sup>	0.06
PROC15	TRA Workers 3.0		Dermal: acute, local	0.01 mg/cm <sup>2</sup>	0.06

Further details on SpERCs, scaling, releases and control technologies are provided in IFRA Guidance "REACH Exposure Scenarios for Fragrance Substances"

assumes operating temperature: ≤ 40 °C

For complete exposure estimation, the values for different routes of exposure and activities may have to be summed up.

#### 4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

EUSES = EUSES version 2.1.1

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## ES 2: Compounding of fragrance oils (small sites)

### 1. Scenario description

Main User Groups	: <b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites
Chemical product category	: <b>PC28:</b> Perfumes, fragrances
Process categories	: <b>PROC1:</b> Use in closed process, no likelihood of exposure <b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure <b>PROC3:</b> Use in closed batch process (synthesis or formulation) <b>PROC5:</b> Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) <b>PROC8a:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities <b>PROC8b:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities <b>PROC9:</b> Transfer of substance or preparation into small containers (dedicated filling line, including weighing) <b>PROC15:</b> Use as laboratory reagent
Environmental Release Categories	: <b>ERC2:</b> Formulation of preparations

### 2.1 Contributing scenario controlling environmental exposure for: ERC2

#### Product characteristics

Viscosity, dynamic : 7.28 mPa.s (at 20 °C)

#### Frequency and duration of use

Continuous exposure : 250 days/year

#### Environment factors not influenced by risk management

Flow rate of receiving surface water : 18,000 m<sup>3</sup>/d

#### Other given operational conditions affecting environmental exposure

Emission or Release Factor: Air : 2.5 %  
Emission or Release Factor: Water : 0.5 %  
Emission or Release Factor: Soil : 0.0 %

#### Technical conditions and measures / Organizational measures

Water : All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.

#### Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant : Municipal sewage treatment plant  
Flow rate of sewage treatment plant effluent : 2,000 m<sup>3</sup>/d  
Effectiveness (of a measure) : 87.7 %  
Sludge Treatment : Can be applied on agricultural soil, when in compliance with local regulations.

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## Conditions and measures related to external treatment of waste for disposal

Disposal methods : Dispose of as hazardous waste in compliance with local and national regulations.

## 2.2 Contributing scenario controlling worker exposure for: PROC1, Liquid substance

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).  
Physical Form (at time of use) : Liquid substance

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## 2.3 Contributing scenario controlling worker exposure for: PROC2, Liquid substance

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).  
Physical Form (at time of use) : Liquid substance

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.4 Contributing scenario controlling worker exposure for: PROC3, Liquid substance

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).  
Physical Form (at time of use) : Liquid substance

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.5 Contributing scenario controlling worker exposure for: PROC5, Liquid substance

### Product characteristics

Concentration of the Substance in : Covers the percentage of the substance in the product up to

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Mixture/Article : 100 % (unless stated differently).  
Physical Form (at time of use) : Liquid substance

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide appropriate exhaust ventilation at machinery. (Effectiveness (of a measure): 90 %)

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
(Effectiveness (of a measure): 90 %)

## 2.6 Contributing scenario controlling worker exposure for: PROC8b, Liquid substance

### Product characteristics

Concentration of the Substance in : Covers the percentage of the substance in the product up to  
Mixture/Article : 100 % (unless stated differently).  
Physical Form (at time of use) : Liquid substance

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). (Effectiveness (of a measure): 70 %)

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
(Effectiveness (of a measure): 90 %)

## 2.7 Contributing scenario controlling worker exposure for: PROC15, Liquid substance

### Product characteristics

Concentration of the Substance in : Covers the percentage of the substance in the product up to  
Mixture/Article : 100 % (unless stated differently).  
Physical Form (at time of use) : Liquid substance

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide sufficient air exchange and/or exhaust in work rooms. (Effectiveness (of a measure): 30 %)

### Conditions and measures related to personal protection, hygiene and health evaluation

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Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.8 Contributing scenario controlling worker exposure for: PROC2, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.9 Contributing scenario controlling worker exposure for: PROC8a, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide appropriate exhaust ventilation at machinery. (Effectiveness (of a measure): 90 %)

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)  
Wear suitable gloves tested to EN374. (Effectiveness (of a measure): 80 %)

## 2.10 Contributing scenario controlling worker exposure for: PROC8b, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide enhanced general ventilation by mechanical means. (Effectiveness (of a measure): 30 %)

### Conditions and measures related to personal protection, hygiene and health evaluation

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Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
(Effectiveness (of a measure): 90 %)

### 2.11 Contributing scenario controlling worker exposure for: PROC9, Liquid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Liquid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

#### Technical conditions and measures

Provide enhanced general ventilation by mechanical means. (Effectiveness (of a measure): 30 %)

#### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear suitable gloves tested to EN374. (Effectiveness (of a measure): 80 %)

### 2.12 Contributing scenario controlling worker exposure for: PROC15, Liquid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Liquid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

#### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

### 3. Exposure estimation and reference to its source

#### Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure (PEC)	RCR
ERC2	EUSES		Fresh water		0.021 mg/l	0.93
			Fresh water sediment		0.21 mg/kg dry weight	0.94
			Marine water		0.002 mg/l	0.93
			Marine sediment		0.02 mg/kg dry weight	0.93
			Sewage treatment plant		0.21 mg/l	0.02
			Soil		0.03 mg/kg dry	0.92



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## Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PROC1, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.07 mg/m <sup>3</sup>	0.02
PROC1	TRA Workers 3.0		Inhalation: short-term, systemic	0.28 mg/m <sup>3</sup>	0.02
PROC1	TRA Workers 3.0		Dermal: long-term, systemic	0.03 mg/cm <sup>2</sup>	0.01
PROC1	TRA Workers 3.0		Dermal: acute, local	0.01 mg/cm <sup>2</sup>	< 0.01
PROC1	TRA Workers 3.0		Chronic dermal local exposure	0.01 mg/cm <sup>2</sup>	< 0.01
PROC2, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC2	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC2	TRA Workers 3.0		Dermal: long-term, systemic	1.37 mg/cm <sup>2</sup>	0.51
PROC2	TRA Workers 3.0		Chronic dermal local exposure	0.2 mg/cm <sup>2</sup>	0.13
PROC2	TRA Workers 3.0		Dermal: acute, local	0.2 mg/cm <sup>2</sup>	0.13
PROC3, liquid	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.10 mg/m <sup>3</sup>	0.70
PROC3	TRA Workers 3.0		Inhalation: short-term, systemic	8.41 mg/m <sup>3</sup>	0.47
PROC3	TRA Workers 3.0		Dermal: long-term, systemic	0.69 mg/cm <sup>2</sup>	0.26
PROC3	TRA Workers 3.0		Chronic dermal local exposure	0.20 mg/cm <sup>2</sup>	0.13
PROC3	TRA Workers 3.0		Dermal: acute, local	0.2 mg/cm <sup>2</sup>	0.13
PROC5, Liquid substance	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.35 mg/m <sup>3</sup>	0.12
PROC5	TRA Workers 3.0		Inhalation: short-term, systemic	1.40 mg/m <sup>3</sup>	0.08
PROC5	TRA Workers 3.0		Dermal: long-term, systemic	1.37 mg/cm <sup>2</sup>	0.51
PROC5	TRA Workers 3.0		Chronic dermal local exposure	0.2 mg/cm <sup>2</sup>	0.13
PROC5	TRA Workers 3.0		Dermal: acute, local	0.2 mg/cm <sup>2</sup>	0.13
PROC8b, Liquid substance	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.05 mg/m <sup>3</sup>	0.35
PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	4.21 mg/m <sup>3</sup>	0.23
PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	1.37 mg/cm <sup>2</sup>	0.51
PROC8b	TRA Workers 3.0		Dermal: acute, local	0.1 mg/cm <sup>2</sup>	0.06
PROC8b	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC15, Liquid substance	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.45 mg/m <sup>3</sup>	0.82
PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/cm <sup>2</sup>	0.55
PROC15	TRA Workers 3.0		Dermal: long-term, systemic	0.34 mg/cm <sup>2</sup>	0.13
PROC15	TRA Workers		Chronic dermal local	0.01 mg/cm <sup>2</sup>	0.06

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	3.0		exposure		
PROC15	TRA Workers 3.0		Dermal: acute, local	0.01 mg/cm <sup>2</sup>	0.06
PROC2, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.42 mg/m <sup>3</sup>	0.14
PROC2	TRA Workers 3.0		Inhalation: short-term, systemic	1.68 mg/m <sup>3</sup>	0.09
PROC2	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/cm <sup>2</sup>	0.30
PROC2	TRA Workers 3.0		Chronic dermal local exposure	0.12 mg/cm <sup>2</sup>	0.08
PROC2	TRA Workers 3.0		Dermal: acute, local	0.12 mg/cm <sup>2</sup>	0.08
PROC8a, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.42 mg/m <sup>3</sup>	0.14
PROC8a	TRA Workers 3.0		Inhalation: short-term, systemic	1.68 mg/m <sup>3</sup>	0.09
PROC8a	TRA Workers 3.0		Dermal: long-term, systemic	1.65 mg/cm <sup>2</sup>	0.61
PROC8a	TRA Workers 3.0		Chronic dermal local exposure	0.12 mg/cm <sup>2</sup>	0.08
PROC8a	TRA Workers 3.0		Dermal: acute, local	0.12 mg/cm <sup>2</sup>	0.08
PROC8b, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m <sup>3</sup>	0.49
PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m <sup>3</sup>	0.33
PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/cm <sup>2</sup>	0.31
PROC8b	TRA Workers 3.0		Dermal: acute, local	0.06 mg/cm <sup>2</sup>	0.04
PROC8b	TRA Workers 3.0		Chronic dermal local exposure	0.06 mg/cm <sup>2</sup>	0.04
PROC9, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m <sup>3</sup>	0.49
PROC9	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m <sup>3</sup>	0.33
PROC9	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/cm <sup>2</sup>	0.31
PROC9	TRA Workers 3.0		Chronic dermal local exposure	0.12 mg/cm <sup>2</sup>	0.08
PROC9	TRA Workers 3.0		Dermal: acute, local	0.12 mg/cm <sup>2</sup>	0.08
PROC15, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.10 mg/m <sup>3</sup>	0.70
PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	8.41 mg/cm <sup>2</sup>	0.47
PROC15	TRA Workers 3.0		Dermal: long-term, systemic	0.20 mg/cm <sup>2</sup>	0.08
PROC15	TRA Workers 3.0		Chronic dermal local exposure	0.06 mg/cm <sup>2</sup>	0.04
PROC15	TRA Workers 3.0		Dermal: acute, local	0.06 mg/cm <sup>2</sup>	0.04

Further details on SpERCs, scaling, releases and control technologies are provided in IFRA Guidance "REACH Exposure Scenarios for Fragrance Substances"

assumes operating temperature: ≤ 40 °C

For complete exposure estimation, the values for different routes of exposure and activities may have to be summed up.

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## **4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario**

EUSES = EUSES version 2.1.1

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**ES 3: Formulation of Cosmetics: low viscosity liquids (Shampoo, hair conditioner, shower gel, foam bath) (large scale), body care soap (medium and large scale) Cosmetics Europe / COLIPA**

## 1. Scenario description

Main User Groups	: <b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites
Chemical product category	: <b>PC28:</b> Perfumes, fragrances
Process categories	: <b>PROC1:</b> Use in closed process, no likelihood of exposure <b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure <b>PROC3:</b> Use in closed batch process (synthesis or formulation) <b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises <b>PROC5:</b> Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) <b>PROC8a:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities <b>PROC8b:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities <b>PROC9:</b> Transfer of substance or preparation into small containers (dedicated filling line, including weighing) <b>PROC14:</b> Production of preparations or articles by tableting, compression, extrusion, pelletisation <b>PROC15:</b> Use as laboratory reagent <b>PROC19:</b> Hand-mixing with intimate contact and only PPE available
Environmental Release Categories	: <b>ERC2:</b> Formulation of preparations
Further information	: Cosmetics Europe / COLIPA

## 2.1 Contributing scenario controlling environmental exposure for: ERC2

### Product characteristics

Viscosity, dynamic : 7.28 mPa.s (at 20 °C)

### Amount used

Daily amount per site : 3252 kg  
Remarks : amount used for the exposure estimation  
Annual amount per site (Msafe) : 812.9 t  
Remarks : Msafe is the maximum amount of substance or product which may be used safely under the conditions defined in the environmental part of the exposure scenario.

### Frequency and duration of use

Continuous exposure : 250 days/year

### Environment factors not influenced by risk management

Flow rate of receiving surface water : 18,000 m<sup>3</sup>/d

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## Other given operational conditions affecting environmental exposure

Emission or Release Factor: Air : 0.0 %  
Emission or Release Factor: Water : 0.1 %  
Emission or Release Factor: Soil : 0.0 %

## Technical conditions and measures / Organizational measures

Water : All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.

## Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant : Municipal sewage treatment plant  
Flow rate of sewage treatment plant effluent : 2,000 m3/d  
Effectiveness (of a measure) : 87.7 %  
Sludge Treatment : Can be applied on agricultural soil, when in compliance with local regulations.

## Conditions and measures related to external treatment of waste for disposal

Disposal methods : Dispose of as hazardous waste in compliance with local and national regulations.

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## 2.2 Contributing scenario controlling worker exposure for: PROC1, Liquid mixture

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Activity : Product delivery/storage - product storage - indoor, Loading of application equipment - batch, indoor (liquid products)

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

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## 2.3 Contributing scenario controlling worker exposure for: PROC2, PROC3, Liquid mixture

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Activity : Process sampling

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

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## 2.4 Contributing scenario controlling worker exposure for: PROC5, PROC8b, Liquid mixture

Activity : Process sampling

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness (of a measure): 90 %)

## 2.5 Contributing scenario controlling worker exposure for: PROC15, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.6 Contributing scenario controlling worker exposure for: PROC2, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## 2.7 Contributing scenario controlling worker exposure for: PROC4, PROC8a, PROC8b, PROC9, Liquid mixture

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### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.8 Contributing scenario controlling worker exposure for: PROC15, Liquid mixture

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## 2.9 Contributing scenario controlling worker exposure for: PROC19, Liquid mixture

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

(Effectiveness (of a measure): 90 %)

## 2.10 Contributing scenario controlling worker exposure for: PROC3, Solid mixture

Activity : Process sampling

### Product characteristics

Concentration of the Substance in : Covers the percentage of the substance in the product up to 25 %.

Mixture/Article

Physical Form (at time of use) : Solid mixture

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### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.11 Contributing scenario controlling worker exposure for: PROC5, Solid mixture

Activity : Process sampling

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)  
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
(Effectiveness (of a measure): 90 %)

## 2.12 Contributing scenario controlling worker exposure for: PROC2, Solid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## 2.13 Contributing scenario controlling worker exposure for: PROC4, PROC8a, PROC9, Solid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day



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### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.14 Contributing scenario controlling worker exposure for: PROC8b, Solid mixture

Activity : Process sampling

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.15 Contributing scenario controlling worker exposure for: PROC14, PROC15, Solid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## 2.16 Contributing scenario controlling worker exposure for: PROC19, Solid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

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### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

(Effectiveness (of a measure): 90 %)

### 3. Exposure estimation and reference to its source

#### Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure (PEC)	RCR
ERC2	EUSES		Fresh water		0.02 mg/l	0.88
			Fresh water sediment		0.20 mg/kg dry weight	0.88
			Marine water		0.002 mg/l	0.88
			Marine sediment		0.02 mg/kg dry weight	0.88
			Sewage treatment plant		0.2 mg/l	0.02
			Soil		0.03 mg/kg dry weight	0.85

#### Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PROC1, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.04 mg/m <sup>3</sup>	0.01
PROC1	TRA Workers 3.0		Inhalation: short-term, systemic	0.17 mg/m <sup>3</sup>	< 0.01
PROC1	TRA Workers 3.0		Dermal: long-term, systemic	0.02 mg/kg bw/d	< 0.01
PROC1	TRA Workers 3.0		Chronic dermal local exposure	0.006 mg/cm <sup>2</sup>	< 0.01
PROC1	TRA Workers 3.0		Dermal: acute, local	0.006 mg/cm <sup>2</sup>	< 0.01
PROC2, PROC3, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 1.26 mg/m <sup>3</sup>	<= 0.42
PROC2, PROC3	TRA Workers 3.0		Inhalation: short-term, systemic	5.05 mg/m <sup>3</sup>	<= 0.28
PROC2, PROC3	TRA Workers 3.0		Dermal: long-term, systemic	<= 0.82 mg/kg bw/day	<= 0.30
PROC2, PROC3	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC2, PROC3	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5, PROC8b, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m <sup>3</sup>	0.49
PROC5, PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m <sup>3</sup>	0.33
PROC5, PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/kg bw/day	0.31
PROC5, PROC8b	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5, PROC8b	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC15, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.10 mg/m <sup>3</sup>	0.70
PROC15	TRA Workers		Inhalation: short-term,	8.41 mg/cm <sup>2</sup>	0.47

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	3.0		systemic		
PROC15	TRA Workers 3.0		Dermal: long-term, systemic	0.20 mg/kg bw/day	0.08
PROC15	TRA Workers 3.0		Chronic dermal local exposure	0.06 mg/cm2	0.04
PROC15	TRA Workers 3.0		Dermal: acute, local	0.06 mg/cm2	0.04
PROC2, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC2	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC2	TRA Workers 3.0		Dermal: long-term, systemic	0.14 mg/kg bw/day	0.05
PROC2	TRA Workers 3.0		Chronic dermal local exposure	0.02 mg/cm2	0.01
PROC2	TRA Workers 3.0		Dermal: acute, local	0.02 mg/cm2	0.01
PROC4, PROC8a, PROC8b, PROC9, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 0.70 mg/m <sup>3</sup>	<= 0.23
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Inhalation: short-term, systemic	<= 2.81 mg/m <sup>3</sup>	<= 0.16
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Dermal: long-term, systemic	<= 1.37 mg/kg bw/day	<= 0.51
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm2	0.06
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Dermal: acute, local	<= 0.1 mg/cm2	<= 0.06
PROC15, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.45 mg/m <sup>3</sup>	0.82
PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/m <sup>3</sup>	0.55
PROC15	TRA Workers 3.0		Dermal: long-term, systemic	0.03 mg/kg bw/d	0.01
PROC15	TRA Workers 3.0		Chronic dermal local exposure	0.01 mg/cm2	< 0.01
PROC15	TRA Workers 3.0		Dermal: acute, local	0.01 mg/cm2	< 0.01
PROC19, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC19	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC19	TRA Workers 3.0		Dermal: long-term, systemic	1.41 mg/kg bw/d	0.52
PROC19	TRA Workers 3.0		Chronic dermal local exposure	0.05 mg/cm2	0.03
PROC19	TRA Workers 3.0		Dermal: acute, local	0.05 mg/cm2	0.03
PROC3, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.26 mg/m <sup>3</sup>	0.42
PROC3	TRA Workers 3.0		Inhalation: short-term, systemic	5.05 mg/m <sup>3</sup>	0.28
PROC3	TRA Workers 3.0		Dermal: long-term, systemic	0.41 mg/kg bw/day	0.15
PROC3	TRA Workers 3.0		Chronic dermal local exposure	0.12 mg/cm2	0.08
PROC3	TRA Workers 3.0		Dermal: acute, local	0.12 mg/cm2	0.08
PROC5, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m <sup>3</sup>	0.49
PROC5	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m <sup>3</sup>	0.33
PROC5	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/kg bw/day	0.31

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PROC5	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm2	<= 0.08
PROC5	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm2	<= 0.08
PROC2, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC2	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC2	TRA Workers 3.0		Dermal: long-term, systemic	0.14 mg/kg bw/day	0.05
PROC2	TRA Workers 3.0		Chronic dermal local exposure	0.02 mg/cm2	0.01
PROC2	TRA Workers 3.0		Dermal: acute, local	0.02 mg/cm2	0.01
PROC4, PROC8a, PROC9, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 0.70 mg/m <sup>3</sup>	<= 0.23
PROC4, PROC8a, PROC9	TRA Workers 3.0		Inhalation: short-term, systemic	<= 2.81 mg/m <sup>3</sup>	<= 0.16
PROC4, PROC8a, PROC9	TRA Workers 3.0		Dermal: long-term, systemic	<= 1.37 mg/kg bw/day	<= 0.51
PROC4, PROC8a, PROC9	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm2	0.06
PROC4, PROC8a, PROC9	TRA Workers 3.0		Dermal: acute, local	<= 0.1 mg/cm2	<= 0.06
PROC8b, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.25 mg/m <sup>3</sup>	0.08
PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	0.98 mg/m <sup>3</sup>	0.06
PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	1.37 mg/kg bw/day	0.51
PROC8b	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm2	0.06
PROC8b	TRA Workers 3.0		Dermal: acute, local	0.1 mg/cm2	0.06
PROC14, PROC15, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.45 mg/m <sup>3</sup>	0.82
PROC14, PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/m <sup>3</sup>	0.55
PROC14, PROC15	TRA Workers 3.0		Dermal: long-term, systemic	<= 0.34 mg/kg bw/d	<= 0.13
PROC14, PROC15	TRA Workers 3.0		Chronic dermal local exposure	<= 0.05 mg/cm2	<= 0.03
PROC14, PROC15	TRA Workers 3.0		Dermal: acute, local	<= 0.05 mg/cm2	<= 0.03
PROC19, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC19	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC19	TRA Workers 3.0		Dermal: long-term, systemic	1.41 mg/kg bw/d	0.52
PROC19	TRA Workers 3.0		Chronic dermal local exposure	0.05 mg/cm2	0.03
PROC19	TRA Workers 3.0		Dermal: acute, local	0.05 mg/cm2	0.03

Further details on SpERCs, scaling, releases and control technologies are provided in IFRA Guidance "REACH Exposure Scenarios for Fragrance Substances"

For complete exposure estimation, the values for different routes of exposure and activities may have to be summed up.

assumes operating temperature: <= 40 °C

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## **4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario**

EUSES = EUSES version 2.1.1

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**ES 4: Formulation of Cosmetics: low viscosity liquids (Shampoo, hair conditioner, shower gel, foam bath) (medium scale), body care soap (medium scale) Cosmetics Europe / COLIPA**

## 1. Scenario description

Main User Groups	: <b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites
Chemical product category	: <b>PC28:</b> Perfumes, fragrances <b>PC39:</b> Cosmetics, personal care products
Process categories	: <b>PROC1:</b> Use in closed process, no likelihood of exposure <b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure <b>PROC3:</b> Use in closed batch process (synthesis or formulation) <b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises <b>PROC5:</b> Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) <b>PROC8a:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities <b>PROC8b:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities <b>PROC9:</b> Transfer of substance or preparation into small containers (dedicated filling line, including weighing) <b>PROC14:</b> Production of preparations or articles by tableting, compression, extrusion, pelletisation <b>PROC15:</b> Use as laboratory reagent <b>PROC19:</b> Hand-mixing with intimate contact and only PPE available
Environmental Release Categories	: <b>ERC2:</b> Formulation of preparations
Further information	: Cosmetics Europe / COLIPA

## 2.1 Contributing scenario controlling environmental exposure for: ERC2

### Product characteristics

Viscosity, dynamic : 7.28 mPa.s (at 20 °C)

Annual amount per site (Msafe) : 407 t

### Frequency and duration of use

Continuous exposure : 250 days/year

### Environment factors not influenced by risk management

Flow rate of receiving surface water : 18,000 m<sup>3</sup>/d

### Other given operational conditions affecting environmental exposure

Emission or Release Factor: Air : 0.0 %

Emission or Release Factor: Water : 0.2 %

Emission or Release Factor: Soil : 0.0 %

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## Technical conditions and measures / Organizational measures

Water : All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.

## Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant : Municipal sewage treatment plant  
Flow rate of sewage treatment : 2,000 m3/d  
plant effluent  
Effectiveness (of a measure) : 87.7 %  
Sludge Treatment : Can be applied on agricultural soil, when in compliance with local regulations.

## Conditions and measures related to external treatment of waste for disposal

Disposal methods : Dispose of as hazardous waste in compliance with local and national regulations.

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## 2.2 Contributing scenario controlling worker exposure for: PROC1, Liquid mixture

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Activity : Product delivery/storage - product storage - indoor, Loading of application equipment - batch, indoor (liquid products)

### Product characteristics

Concentration of the Substance in : Covers the percentage of the substance in the product up to  
Mixture/Article 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

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## 2.3 Contributing scenario controlling worker exposure for: PROC2, PROC3, Liquid mixture

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Activity : Process sampling

### Product characteristics

Concentration of the Substance in : Covers the percentage of the substance in the product up to  
Mixture/Article 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

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## 2.4 Contributing scenario controlling worker exposure for: PROC5, PROC8b, Liquid mixture

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Activity : Process sampling

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### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)  
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
(Effectiveness (of a measure): 90 %)

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## 2.5 Contributing scenario controlling worker exposure for: PROC15, Liquid mixture

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### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

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## 2.6 Contributing scenario controlling worker exposure for: PROC2, Liquid mixture

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### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

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## 2.7 Contributing scenario controlling worker exposure for: PROC4, PROC8a, PROC8b, PROC9, Liquid mixture

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### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Liquid mixture



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## Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.8 Contributing scenario controlling worker exposure for: PROC15, Liquid mixture

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## 2.9 Contributing scenario controlling worker exposure for: PROC19, Liquid mixture

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
(Effectiveness (of a measure): 90 %)

## 2.10 Contributing scenario controlling worker exposure for: PROC3, Solid mixture

Activity : Process sampling

### Product characteristics

Concentration of the Substance in : Covers the percentage of the substance in the product up to 25 %.

Mixture/Article

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

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Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.11 Contributing scenario controlling worker exposure for: PROC5, Solid mixture

Activity : Process sampling

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness (of a measure): 90 %)

## 2.12 Contributing scenario controlling worker exposure for: PROC2, Solid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## 2.13 Contributing scenario controlling worker exposure for: PROC4, PROC8a, PROC9, Solid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

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Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.14 Contributing scenario controlling worker exposure for: PROC8b, Solid mixture

Activity : Process sampling

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.15 Contributing scenario controlling worker exposure for: PROC14, PROC15, Solid mixture

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## 2.16 Contributing scenario controlling worker exposure for: PROC19, Solid mixture

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
(Effectiveness (of a measure): 90 %)

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**3. Exposure estimation and reference to its source****Environment**

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure (PEC)	RCR
ERC2	EUSES		Fresh water		0.02 mg/l	0.88
			Fresh water sediment		0.20 mg/kg dry weight	0.88
			Marine water		0.002 mg/l	0.88
			Marine sediment		0.02 mg/kg dry weight	0.88
			Sewage treatment plant		0.20 mg/l	0.02
			Soil		0.03 mg/kg dry weight	0.85

**Workers**

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PROC1, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.04 mg/m <sup>3</sup>	0.01
PROC1	TRA Workers 3.0		Inhalation: short-term, systemic	0.17 mg/m <sup>3</sup>	< 0.01
PROC1	TRA Workers 3.0		Dermal: long-term, systemic	0.02 mg/kg bw/d	< 0.01
PROC1	TRA Workers 3.0		Chronic dermal local exposure	0.006 mg/cm <sup>2</sup>	< 0.01
PROC1	TRA Workers 3.0		Dermal: acute, local	0.006 mg/cm <sup>2</sup>	< 0.01
PROC2, PROC3, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 1.26 mg/m <sup>3</sup>	<= 0.42
PROC2, PROC3	TRA Workers 3.0		Inhalation: short-term, systemic	5.05 mg/m <sup>3</sup>	<= 0.28
PROC2, PROC3	TRA Workers 3.0		Dermal: long-term, systemic	<= 0.82 mg/kg bw/day	<= 0.30
PROC2, PROC3	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC2, PROC3	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5, PROC8b, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m <sup>3</sup>	0.49
PROC5, PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m <sup>3</sup>	0.33
PROC5, PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/kg bw/day	0.31
PROC5, PROC8b	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5, PROC8b	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC15, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.10 mg/m <sup>3</sup>	0.70
PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	8.41 mg/cm <sup>2</sup>	0.47
PROC15	TRA Workers 3.0		Dermal: long-term, systemic	0.20 mg/kg bw/day	0.08
PROC15	TRA Workers		Chronic dermal local	0.06 mg/cm <sup>2</sup>	0.04

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	3.0		exposure		
PROC15	TRA Workers 3.0		Dermal: acute, local	0.06 mg/cm <sup>2</sup>	0.04
PROC2, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC2	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC2	TRA Workers 3.0		Dermal: long-term, systemic	0.14 mg/kg bw/day	0.05
PROC2	TRA Workers 3.0		Chronic dermal local exposure	0.02 mg/cm <sup>2</sup>	0.01
PROC2	TRA Workers 3.0		Dermal: acute, local	0.02 mg/cm <sup>2</sup>	0.01
PROC4, PROC8a, PROC8b, PROC9, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 0.70 mg/m <sup>3</sup>	<= 0.23
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Inhalation: short-term, systemic	<= 2.81 mg/m <sup>3</sup>	<= 0.16
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Dermal: long-term, systemic	<= 1.37 mg/kg bw/day	<= 0.51
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Dermal: acute, local	<= 0.1 mg/cm <sup>2</sup>	<= 0.06
PROC15, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.45 mg/m <sup>3</sup>	0.82
PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/m <sup>3</sup>	0.55
PROC15	TRA Workers 3.0		Dermal: long-term, systemic	0.03 mg/kg bw/d	0.01
PROC15	TRA Workers 3.0		Chronic dermal local exposure	0.01 mg/cm <sup>2</sup>	< 0.01
PROC15	TRA Workers 3.0		Dermal: acute, local	0.01 mg/cm <sup>2</sup>	< 0.01
PROC19, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC19	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC19	TRA Workers 3.0		Dermal: long-term, systemic	1.41 mg/kg bw/d	0.52
PROC19	TRA Workers 3.0		Chronic dermal local exposure	0.05 mg/cm <sup>2</sup>	0.03
PROC19	TRA Workers 3.0		Dermal: acute, local	0.05 mg/cm <sup>2</sup>	0.03
PROC3, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.26 mg/m <sup>3</sup>	0.42
PROC3	TRA Workers 3.0		Inhalation: short-term, systemic	5.05 mg/m <sup>3</sup>	0.28
PROC3	TRA Workers 3.0		Dermal: long-term, systemic	0.41 mg/kg bw/day	0.15
PROC3	TRA Workers 3.0		Chronic dermal local exposure	0.12 mg/cm <sup>2</sup>	0.08
PROC3	TRA Workers 3.0		Dermal: acute, local	0.12 mg/cm <sup>2</sup>	0.08
PROC5, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m <sup>3</sup>	0.49
PROC5	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m <sup>3</sup>	0.33
PROC5	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/kg bw/day	0.31
PROC5	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08

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PROC2, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC2	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC2	TRA Workers 3.0		Dermal: long-term, systemic	0.14 mg/kg bw/day	0.05
PROC2	TRA Workers 3.0		Chronic dermal local exposure	0.02 mg/cm <sup>2</sup>	0.01
PROC2	TRA Workers 3.0		Dermal: acute, local	0.02 mg/cm <sup>2</sup>	0.01
PROC4, PROC8a, PROC9, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 0.70 mg/m <sup>3</sup>	<= 0.23
PROC4, PROC8a, PROC9	TRA Workers 3.0		Inhalation: short-term, systemic	<= 2.81 mg/m <sup>3</sup>	<= 0.16
PROC4, PROC8a, PROC9	TRA Workers 3.0		Dermal: long-term, systemic	<= 1.37 mg/kg bw/day	<= 0.51
PROC4, PROC8a, PROC9	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC4, PROC8a, PROC9	TRA Workers 3.0		Dermal: acute, local	<= 0.1 mg/cm <sup>2</sup>	<= 0.06
PROC8b, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.25 mg/m <sup>3</sup>	0.08
PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	0.98 mg/m <sup>3</sup>	0.06
PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	1.37 mg/kg bw/day	0.51
PROC8b	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC8b	TRA Workers 3.0		Dermal: acute, local	0.1 mg/cm <sup>2</sup>	0.06
PROC14, PROC15, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.45 mg/m <sup>3</sup>	0.82
PROC14, PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/m <sup>3</sup>	0.55
PROC14, PROC15	TRA Workers 3.0		Dermal: long-term, systemic	<= 0.34 mg/kg bw/d	<= 0.13
PROC14, PROC15	TRA Workers 3.0		Chronic dermal local exposure	<= 0.05 mg/cm <sup>2</sup>	<= 0.03
PROC14, PROC15	TRA Workers 3.0		Dermal: acute, local	<= 0.05 mg/cm <sup>2</sup>	<= 0.03
PROC19, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC19	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC19	TRA Workers 3.0		Dermal: long-term, systemic	1.41 mg/kg bw/d	0.52
PROC19	TRA Workers 3.0		Chronic dermal local exposure	0.05 mg/cm <sup>2</sup>	0.03
PROC19	TRA Workers 3.0		Dermal: acute, local	0.05 mg/cm <sup>2</sup>	0.03

Further details on SpERCs, scaling, releases and control technologies are provided in IFRA Guidance "REACH Exposure Scenarios for Fragrance Substances"

For complete exposure estimation, the values for different routes of exposure and activities may have to be summed up.

assumes operating temperature: <= 40 °C

#### 4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

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EUSES = EUSES version 2.1.1

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## **ES 5: Formulation of Cosmetics: low viscosity liquids (Shampoo, hair conditioner, shower gel, foam bath) (small scale) Cosmetics Europe / COLIPA**

### **1. Scenario description**

Main User Groups	: <b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites
Chemical product category	: <b>PC28:</b> Perfumes, fragrances <b>PC39:</b> Cosmetics, personal care products
Process categories	: <b>PROC1:</b> Use in closed process, no likelihood of exposure <b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure <b>PROC3:</b> Use in closed batch process (synthesis or formulation) <b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises <b>PROC5:</b> Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) <b>PROC8a:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities <b>PROC8b:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities <b>PROC9:</b> Transfer of substance or preparation into small containers (dedicated filling line, including weighing) <b>PROC14:</b> Production of preparations or articles by tableting, compression, extrusion, pelletisation <b>PROC15:</b> Use as laboratory reagent <b>PROC19:</b> Hand-mixing with intimate contact and only PPE available
Environmental Release Categories	: <b>ERC2:</b> Formulation of preparations
Further information	: Cosmetics Europe / COLIPA

### **2.1 Contributing scenario controlling environmental exposure for: ERC2**

#### **Product characteristics**

Viscosity, dynamic	: 7.28 mPa.s (at 20 °C)
Annual amount per site (Msafe)	: 203.9 t
Remarks	: Msafe is the maximum amount of substance or product which may be used safely under the conditions defined in the environmental part of the exposure scenario.

#### **Frequency and duration of use**

Continuous exposure	: 250 days/year
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#### **Environment factors not influenced by risk management**

Flow rate of receiving surface water	: 18,000 m <sup>3</sup> /d
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#### **Other given operational conditions affecting environmental exposure**

Emission or Release Factor: Air	: 0.0 %
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Emission or Release Factor: Water : 0.4 %  
Emission or Release Factor: Soil : 0.0 %

### Technical conditions and measures / Organizational measures

Water : All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.

### Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant : Municipal sewage treatment plant  
Flow rate of sewage treatment : 2,000 m<sup>3</sup>/d  
plant effluent  
Effectiveness (of a measure) : 87.7 %  
Sludge Treatment : Can be applied on agricultural soil, when in compliance with local regulations.

### Conditions and measures related to external treatment of waste for disposal

Disposal methods : Dispose of as hazardous waste in compliance with local and national regulations.

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## 2.2 Contributing scenario controlling worker exposure for: PROC1, Liquid mixture

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Activity : Product delivery/storage - product storage - indoor, Loading of application equipment - batch, indoor (liquid products)

### Product characteristics

Concentration of the Substance in : Covers the percentage of the substance in the product up to  
Mixture/Article 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : ≤ 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

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## 2.3 Contributing scenario controlling worker exposure for: PROC2, PROC3, Liquid mixture

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Activity : Process sampling

### Product characteristics

Concentration of the Substance in : Covers the percentage of the substance in the product up to  
Mixture/Article 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : ≤ 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

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## 2.4 Contributing scenario controlling worker exposure for: PROC5, PROC8b, Liquid mixture

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Activity : Process sampling

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness (of a measure): 90 %)

## 2.5 Contributing scenario controlling worker exposure for: PROC15, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.6 Contributing scenario controlling worker exposure for: PROC2, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## 2.7 Contributing scenario controlling worker exposure for: PROC4, PROC8a, PROC8b, PROC9, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

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Mixture/Article

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.8 Contributing scenario controlling worker exposure for: PROC15, Liquid mixture

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## 2.9 Contributing scenario controlling worker exposure for: PROC19, Liquid mixture

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
(Effectiveness (of a measure): 90 %)

## 2.10 Contributing scenario controlling worker exposure for: PROC3, Solid mixture

Activity : Process sampling

### Product characteristics

Concentration of the Substance in : Covers the percentage of the substance in the product up to 25 %.

Mixture/Article

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

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## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

---

### 2.11 Contributing scenario controlling worker exposure for: PROC5, Solid mixture

---

Activity : Process sampling

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Solid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness (of a measure): 90 %)

---

### 2.12 Contributing scenario controlling worker exposure for: PROC2, Solid mixture

---

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Solid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

---

### 2.13 Contributing scenario controlling worker exposure for: PROC4, PROC8a, PROC9, Solid mixture

---

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Solid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

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## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

### 2.14 Contributing scenario controlling worker exposure for: PROC8b, Solid mixture

Activity : Process sampling

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Solid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

#### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

### 2.15 Contributing scenario controlling worker exposure for: PROC14, PROC15, Solid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Solid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

#### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

### 2.16 Contributing scenario controlling worker exposure for: PROC19, Solid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Solid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

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Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
(Effectiveness (of a measure): 90 %)

### 3. Exposure estimation and reference to its source

#### Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure (PEC)	RCR
ERC2	EUSES		Fresh water		0.02 mg/l	0.88
			Fresh water sediment		0.20 mg/kg dry weight	0.88
			Marine water		0.02 mg/l	0.88
			Marine sediment		0.02 mg/kg dry weight	0.88
			Sewage treatment plant		0.2 mg/l	0.02
			Soil		0.03 mg/kg dry weight	0.85

#### Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PROC1, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.04 mg/m <sup>3</sup>	0.01
PROC1	TRA Workers 3.0		Inhalation: short-term, systemic	0.17 mg/m <sup>3</sup>	< 0.01
PROC1	TRA Workers 3.0		Dermal: long-term, systemic	0.02 mg/kg bw/d	< 0.01
PROC1	TRA Workers 3.0		Chronic dermal local exposure	0.006 mg/cm <sup>2</sup>	< 0.01
PROC1	TRA Workers 3.0		Dermal: acute, local	0.006 mg/cm <sup>2</sup>	< 0.01
PROC2, PROC3, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 1.26 mg/m <sup>3</sup>	<= 0.42
PROC2, PROC3	TRA Workers 3.0		Inhalation: short-term, systemic	5.05 mg/m <sup>3</sup>	<= 0.28
PROC2, PROC3	TRA Workers 3.0		Dermal: long-term, systemic	<= 0.82 mg/kg bw/day	<= 0.30
PROC2, PROC3	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC2, PROC3	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5, PROC8b, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m <sup>3</sup>	0.49
PROC5, PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m <sup>3</sup>	0.33
PROC5, PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/kg bw/day	0.31
PROC5, PROC8b	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5, PROC8b	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC15, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.10 mg/m <sup>3</sup>	0.70
PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	8.41 mg/cm <sup>2</sup>	0.47
PROC15	TRA Workers		Dermal: long-term,	0.20 mg/kg bw/day	0.08

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	3.0		systemic		
PROC15	TRA Workers 3.0		Chronic dermal local exposure	0.06 mg/cm2	0.04
PROC15	TRA Workers 3.0		Dermal: acute, local	0.06 mg/cm2	0.04
PROC2, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m³	0.23
PROC2	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m³	0.16
PROC2	TRA Workers 3.0		Dermal: long-term, systemic	0.14 mg/kg bw/day	0.05
PROC2	TRA Workers 3.0		Chronic dermal local exposure	0.02 mg/cm2	0.01
PROC2	TRA Workers 3.0		Dermal: acute, local	0.02 mg/cm2	0.01
PROC4, PROC8a, PROC8b, PROC9, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 0.70 mg/m³	<= 0.23
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Inhalation: short-term, systemic	<= 2.81 mg/m³	<= 0.16
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Dermal: long-term, systemic	<= 1.37 mg/kg bw/day	<= 0.51
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm2	0.06
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Dermal: acute, local	<= 0.1 mg/cm2	<= 0.06
PROC15, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.45 mg/m³	0.82
PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/m³	0.55
PROC15	TRA Workers 3.0		Dermal: long-term, systemic	0.03 mg/kg bw/d	0.01
PROC15	TRA Workers 3.0		Chronic dermal local exposure	0.01 mg/cm2	< 0.01
PROC15	TRA Workers 3.0		Dermal: acute, local	0.01 mg/cm2	< 0.01
PROC19, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m³	0.23
PROC19	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m³	0.16
PROC19	TRA Workers 3.0		Dermal: long-term, systemic	1.41 mg/kg bw/d	0.52
PROC19	TRA Workers 3.0		Chronic dermal local exposure	0.05 mg/cm2	0.03
PROC19	TRA Workers 3.0		Dermal: acute, local	0.05 mg/cm2	0.03
PROC3, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.26 mg/m³	0.42
PROC3	TRA Workers 3.0		Inhalation: short-term, systemic	5.05 mg/m³	0.28
PROC3	TRA Workers 3.0		Dermal: long-term, systemic	0.41 mg/kg bw/day	0.15
PROC3	TRA Workers 3.0		Chronic dermal local exposure	0.12 mg/cm2	0.08
PROC3	TRA Workers 3.0		Dermal: acute, local	0.12 mg/cm2	0.08
PROC5, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m³	0.49
PROC5	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m³	0.33
PROC5	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/kg bw/day	0.31
PROC5	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm2	<= 0.08

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PROC5	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC2, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC2	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC2	TRA Workers 3.0		Dermal: long-term, systemic	0.14 mg/kg bw/day	0.05
PROC2	TRA Workers 3.0		Chronic dermal local exposure	0.02 mg/cm <sup>2</sup>	0.01
PROC2	TRA Workers 3.0		Dermal: acute, local	0.02 mg/cm <sup>2</sup>	0.01
PROC4, PROC8a, PROC9, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 0.70 mg/m <sup>3</sup>	<= 0.23
PROC4, PROC8a, PROC9	TRA Workers 3.0		Inhalation: short-term, systemic	<= 2.81 mg/m <sup>3</sup>	<= 0.16
PROC4, PROC8a, PROC9	TRA Workers 3.0		Dermal: long-term, systemic	<= 1.37 mg/kg bw/day	<= 0.51
PROC4, PROC8a, PROC9	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC4, PROC8a, PROC9	TRA Workers 3.0		Dermal: acute, local	<= 0.1 mg/cm <sup>2</sup>	<= 0.06
PROC8b, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.25 mg/m <sup>3</sup>	0.08
PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	0.98 mg/m <sup>3</sup>	0.06
PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	1.37 mg/kg bw/day	0.51
PROC8b	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC8b	TRA Workers 3.0		Dermal: acute, local	0.1 mg/cm <sup>2</sup>	0.06
PROC14, PROC15, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.45 mg/m <sup>3</sup>	0.82
PROC14, PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/m <sup>3</sup>	0.55
PROC14, PROC15	TRA Workers 3.0		Dermal: long-term, systemic	<= 0.34 mg/kg bw/d	<= 0.13
PROC14, PROC15	TRA Workers 3.0		Chronic dermal local exposure	<= 0.05 mg/cm <sup>2</sup>	<= 0.03
PROC14, PROC15	TRA Workers 3.0		Dermal: acute, local	<= 0.05 mg/cm <sup>2</sup>	<= 0.03
PROC19, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC19	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC19	TRA Workers 3.0		Dermal: long-term, systemic	1.41 mg/kg bw/d	0.52
PROC19	TRA Workers 3.0		Chronic dermal local exposure	0.05 mg/cm <sup>2</sup>	0.03
PROC19	TRA Workers 3.0		Dermal: acute, local	0.05 mg/cm <sup>2</sup>	0.03

Further details on SpERCs, scaling, releases and control technologies are provided in IFRA Guidance "REACH Exposure Scenarios for Fragrance Substances"

For complete exposure estimation, the values for different routes of exposure and activities may have to be summed up.

assumes operating temperature: <= 40 °C

#### 4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario



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EUSES = EUSES version 2.1.1

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## ES 6: Formulation of Cosmetics: Medium Viscosity Body Care Products (medium scale), Non-liquid Creams (skin care, body care, mascara, solar oil, make-up foundation) (large scale) Cosmetics Europe / COLIPA

### 1. Scenario description

Main User Groups	: <b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites
Chemical product category	: <b>PC28:</b> Perfumes, fragrances <b>PC39:</b> Cosmetics, personal care products
Process categories	: <b>PROC1:</b> Use in closed process, no likelihood of exposure <b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure <b>PROC3:</b> Use in closed batch process (synthesis or formulation) <b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises <b>PROC5:</b> Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) <b>PROC8a:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities <b>PROC8b:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities <b>PROC9:</b> Transfer of substance or preparation into small containers (dedicated filling line, including weighing) <b>PROC14:</b> Production of preparations or articles by tableting, compression, extrusion, pelletisation <b>PROC15:</b> Use as laboratory reagent <b>PROC19:</b> Hand-mixing with intimate contact and only PPE available
Environmental Release Categories	: <b>ERC2:</b> Formulation of preparations
Further information	: Cosmetics Europe / COLIPA

### 2.1 Contributing scenario controlling environmental exposure for: ERC2

#### Product characteristics

Viscosity, dynamic	: 7.28 mPa.s (at 20 °C)
Annual amount per site (M <sub>safe</sub> )	: 81.9 t
Remarks	: M <sub>safe</sub> is the maximum amount of substance or product which may be used safely under the conditions defined in the environmental part of the exposure scenario.

#### Frequency and duration of use

Continuous exposure	: 250 days/year
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#### Environment factors not influenced by risk management

Flow rate of receiving surface water	: 18,000 m <sup>3</sup> /d
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#### Other given operational conditions affecting environmental exposure

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Emission or Release Factor: Air : 0.0 %  
Emission or Release Factor: Water : 1 %  
Emission or Release Factor: Soil : 0.0 %

### Technical conditions and measures / Organizational measures

Water : All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.

### Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant : Municipal sewage treatment plant  
Flow rate of sewage treatment : 2,000 m<sup>3</sup>/d  
plant effluent  
Effectiveness (of a measure) : 87.7 %  
Sludge Treatment : Can be applied on agricultural soil, when in compliance with local regulations.

### Conditions and measures related to external treatment of waste for disposal

Disposal methods : Dispose of as hazardous waste in compliance with local and national regulations.

---

## 2.2 Contributing scenario controlling worker exposure for: PROC1, Liquid mixture

---

Activity : Product delivery/storage - product storage - indoor, Loading of application equipment - batch, indoor (liquid products)

### Product characteristics

Concentration of the Substance in : Covers the percentage of the substance in the product up to  
Mixture/Article 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

---

## 2.3 Contributing scenario controlling worker exposure for: PROC2, PROC3, Liquid mixture

---

Activity : Process sampling

### Product characteristics

Concentration of the Substance in : Covers the percentage of the substance in the product up to  
Mixture/Article 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

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### 2.4 Contributing scenario controlling worker exposure for: PROC5, PROC8b, Liquid mixture

Activity : Process sampling

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Liquid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

#### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

#### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness (of a measure): 90 %)

### 2.5 Contributing scenario controlling worker exposure for: PROC15, Liquid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Liquid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

#### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

### 2.6 Contributing scenario controlling worker exposure for: PROC2, Liquid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Liquid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### 2.7 Contributing scenario controlling worker exposure for: PROC4, PROC8a, PROC8b, PROC9, Liquid mixture

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### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.8 Contributing scenario controlling worker exposure for: PROC15, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## 2.9 Contributing scenario controlling worker exposure for: PROC19, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)  
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
(Effectiveness (of a measure): 90 %)

## 2.10 Contributing scenario controlling worker exposure for: PROC3, Solid mixture

Activity : Process sampling

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Solid mixture

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## Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

### 2.11 Contributing scenario controlling worker exposure for: PROC5, Solid mixture

Activity : Process sampling

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Solid mixture

## Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)  
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
(Effectiveness (of a measure): 90 %)

### 2.12 Contributing scenario controlling worker exposure for: PROC2, Solid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Solid mixture

## Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### 2.13 Contributing scenario controlling worker exposure for: PROC4, PROC8a, PROC9, Solid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Solid mixture

## Frequency and duration of use

Frequency of use : <= 8 hours/day

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## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

---

## 2.14 Contributing scenario controlling worker exposure for: PROC8b, Solid mixture

---

Activity : Process sampling

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

---

## 2.15 Contributing scenario controlling worker exposure for: PROC14, PROC15, Solid mixture

---

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

---

## 2.16 Contributing scenario controlling worker exposure for: PROC19, Solid mixture

---

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

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### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

(Effectiveness (of a measure): 90 %)

### 3. Exposure estimation and reference to its source

#### Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure (PEC)	RCR
ERC2	EUSES		Fresh water		0.02 mg/l	0.89
			Fresh water sediment		0.20 mg/kg dry weight	0.89
			Marine water		0.002 mg/l	0.89
			Marine sediment		0.02 mg/kg dry weight	0.89
			Sewage treatment plant		0.20 mg/l	0.02
			Soil		0.03 mg/kg dry weight	0.85

#### Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PROC1, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.04 mg/m <sup>3</sup>	0.01
PROC1	TRA Workers 3.0		Inhalation: short-term, systemic	0.17 mg/m <sup>3</sup>	< 0.01
PROC1	TRA Workers 3.0		Dermal: long-term, systemic	0.02 mg/kg bw/d	< 0.01
PROC1	TRA Workers 3.0		Chronic dermal local exposure	0.006 mg/cm <sup>2</sup>	< 0.01
PROC1	TRA Workers 3.0		Dermal: acute, local	0.006 mg/cm <sup>2</sup>	< 0.01
PROC2, PROC3, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 1.26 mg/m <sup>3</sup>	<= 0.42
PROC2, PROC3	TRA Workers 3.0		Inhalation: short-term, systemic	5.05 mg/m <sup>3</sup>	<= 0.28
PROC2, PROC3	TRA Workers 3.0		Dermal: long-term, systemic	<= 0.82 mg/kg bw/day	<= 0.30
PROC2, PROC3	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC2, PROC3	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5, PROC8b, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m <sup>3</sup>	0.49
PROC5, PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m <sup>3</sup>	0.33
PROC5, PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/kg bw/day	0.31
PROC5, PROC8b	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5, PROC8b	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC15, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.10 mg/m <sup>3</sup>	0.70
PROC15	TRA Workers		Inhalation: short-term,	8.41 mg/cm <sup>2</sup>	0.47



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	3.0		systemic		
PROC15	TRA Workers 3.0		Dermal: long-term, systemic	0.20 mg/kg bw/day	0.08
PROC15	TRA Workers 3.0		Chronic dermal local exposure	0.06 mg/cm2	0.04
PROC15	TRA Workers 3.0		Dermal: acute, local	0.06 mg/cm2	0.04
PROC2, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m3	0.23
PROC2	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m3	0.16
PROC2	TRA Workers 3.0		Dermal: long-term, systemic	0.14 mg/kg bw/day	0.05
PROC2	TRA Workers 3.0		Chronic dermal local exposure	0.02 mg/cm2	0.01
PROC2	TRA Workers 3.0		Dermal: acute, local	0.02 mg/cm2	0.01
PROC4, PROC8a, PROC8b, PROC9, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 0.70 mg/m3	<= 0.23
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Inhalation: short-term, systemic	<= 2.81 mg/m3	<= 0.16
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Dermal: long-term, systemic	<= 1.37 mg/kg bw/day	<= 0.51
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm2	0.06
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Dermal: acute, local	<= 0.1 mg/cm2	<= 0.06
PROC15, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.45 mg/m3	0.82
PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/m3	0.55
PROC15	TRA Workers 3.0		Dermal: long-term, systemic	0.03 mg/kg bw/d	0.01
PROC15	TRA Workers 3.0		Chronic dermal local exposure	0.01 mg/cm2	< 0.01
PROC15	TRA Workers 3.0		Dermal: acute, local	0.01 mg/cm2	< 0.01
PROC19, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m3	0.23
PROC19	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m3	0.16
PROC19	TRA Workers 3.0		Dermal: long-term, systemic	1.41 mg/kg bw/d	0.52
PROC19	TRA Workers 3.0		Chronic dermal local exposure	0.05 mg/cm2	0.03
PROC19	TRA Workers 3.0		Dermal: acute, local	0.05 mg/cm2	0.03
PROC3, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.26 mg/m3	0.42
PROC3	TRA Workers 3.0		Inhalation: short-term, systemic	5.05 mg/m3	0.28
PROC3	TRA Workers 3.0		Dermal: long-term, systemic	0.41 mg/kg bw/day	0.15
PROC3	TRA Workers 3.0		Chronic dermal local exposure	0.12 mg/cm2	0.08
PROC3	TRA Workers 3.0		Dermal: acute, local	0.12 mg/cm2	0.08
PROC5, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m3	0.49
PROC5	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m3	0.33
PROC5	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/kg bw/day	0.31

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PROC5	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC2, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC2	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC2	TRA Workers 3.0		Dermal: long-term, systemic	0.14 mg/kg bw/day	0.05
PROC2	TRA Workers 3.0		Chronic dermal local exposure	0.02 mg/cm <sup>2</sup>	0.01
PROC2	TRA Workers 3.0		Dermal: acute, local	0.02 mg/cm <sup>2</sup>	0.01
PROC4, PROC8a, PROC9, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 0.70 mg/m <sup>3</sup>	<= 0.23
PROC4, PROC8a, PROC9	TRA Workers 3.0		Inhalation: short-term, systemic	<= 2.81 mg/m <sup>3</sup>	<= 0.16
PROC4, PROC8a, PROC9	TRA Workers 3.0		Dermal: long-term, systemic	<= 1.37 mg/kg bw/day	<= 0.51
PROC4, PROC8a, PROC9	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC4, PROC8a, PROC9	TRA Workers 3.0		Dermal: acute, local	<= 0.1 mg/cm <sup>2</sup>	<= 0.06
PROC8b, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.25 mg/m <sup>3</sup>	0.08
PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	0.98 mg/m <sup>3</sup>	0.06
PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	1.37 mg/kg bw/day	0.51
PROC8b	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC8b	TRA Workers 3.0		Dermal: acute, local	0.1 mg/cm <sup>2</sup>	0.06
PROC14, PROC15, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.45 mg/m <sup>3</sup>	0.82
PROC14, PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/m <sup>3</sup>	0.55
PROC14, PROC15	TRA Workers 3.0		Dermal: long-term, systemic	<= 0.34 mg/kg bw/d	<= 0.13
PROC14, PROC15	TRA Workers 3.0		Chronic dermal local exposure	<= 0.05 mg/cm <sup>2</sup>	<= 0.03
PROC14, PROC15	TRA Workers 3.0		Dermal: acute, local	<= 0.05 mg/cm <sup>2</sup>	<= 0.03
PROC19, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC19	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC19	TRA Workers 3.0		Dermal: long-term, systemic	1.41 mg/kg bw/d	0.52
PROC19	TRA Workers 3.0		Chronic dermal local exposure	0.05 mg/cm <sup>2</sup>	0.03
PROC19	TRA Workers 3.0		Dermal: acute, local	0.05 mg/cm <sup>2</sup>	0.03

Further details on SpERCs, scaling, releases and control technologies are provided in IFRA Guidance "REACH Exposure Scenarios for Fragrance Substances"

For complete exposure estimation, the values for different routes of exposure and activities may have to be summed up.

assumes operating temperature: <= 40 °C

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## **4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario**

EUSES = EUSES version 2.1.1

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## **ES 7: Formulation of Cosmetics: Non-liquid Creams (skin care, body care, mascara, solar oil, make-up foundation) (small scale) Cosmetics Europe / COLIPA**

### **1. Scenario description**

Main User Groups	: <b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites
Chemical product category	: <b>PC28:</b> Perfumes, fragrances <b>PC39:</b> Cosmetics, personal care products
Process categories	: <b>PROC1:</b> Use in closed process, no likelihood of exposure <b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure <b>PROC3:</b> Use in closed batch process (synthesis or formulation) <b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises <b>PROC5:</b> Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) <b>PROC8a:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities <b>PROC8b:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities <b>PROC9:</b> Transfer of substance or preparation into small containers (dedicated filling line, including weighing) <b>PROC14:</b> Production of preparations or articles by tableting, compression, extrusion, pelletisation <b>PROC15:</b> Use as laboratory reagent <b>PROC19:</b> Hand-mixing with intimate contact and only PPE available
Environmental Release Categories	: <b>ERC2:</b> Formulation of preparations
Further information	: Cosmetics Europe / COLIPA

### **2.1 Contributing scenario controlling environmental exposure for: ERC2**

#### **Product characteristics**

Viscosity, dynamic	: 7.28 mPa.s (at 20 °C)
Annual amount per site (Msafe)	: 20.3 t
Remarks	: Msafe is the maximum amount of substance or product which may be used safely under the conditions defined in the environmental part of the exposure scenario.

#### **Frequency and duration of use**

Continuous exposure	: 250 days/year
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#### **Environment factors not influenced by risk management**

Flow rate of receiving surface water	: 18,000 m <sup>3</sup> /d
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#### **Other given operational conditions affecting environmental exposure**

Emission or Release Factor: Air	: 0.0 %
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Emission or Release Factor: Water : 4 %  
Emission or Release Factor: Soil : 0.0 %

### Technical conditions and measures / Organizational measures

Water : All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.

### Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant : Municipal sewage treatment plant  
Flow rate of sewage treatment : 2,000 m<sup>3</sup>/d  
plant effluent  
Effectiveness (of a measure) : 87.7 %  
Sludge Treatment : Can be applied on agricultural soil, when in compliance with local regulations.

### Conditions and measures related to external treatment of waste for disposal

Disposal methods : Dispose of as hazardous waste in compliance with local and national regulations.

---

## 2.2 Contributing scenario controlling worker exposure for: PROC1, Liquid mixture

---

Activity : Product delivery/storage - product storage - indoor, Loading of application equipment - batch, indoor (liquid products)

### Product characteristics

Concentration of the Substance in : Covers the percentage of the substance in the product up to  
Mixture/Article 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

---

## 2.3 Contributing scenario controlling worker exposure for: PROC2, PROC3, Liquid mixture

---

Activity : Process sampling

### Product characteristics

Concentration of the Substance in : Covers the percentage of the substance in the product up to  
Mixture/Article 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

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## 2.4 Contributing scenario controlling worker exposure for: PROC5, PROC8b, Liquid mixture

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Activity : Process sampling

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness (of a measure): 90 %)

## 2.5 Contributing scenario controlling worker exposure for: PROC15, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.6 Contributing scenario controlling worker exposure for: PROC2, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## 2.7 Contributing scenario controlling worker exposure for: PROC4, PROC8a, PROC8b, PROC9, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

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Mixture/Article

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.8 Contributing scenario controlling worker exposure for: PROC15, Liquid mixture

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## 2.9 Contributing scenario controlling worker exposure for: PROC19, Liquid mixture

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
(Effectiveness (of a measure): 90 %)

## 2.10 Contributing scenario controlling worker exposure for: PROC3, Solid mixture

Activity : Process sampling

### Product characteristics

Concentration of the Substance in : Covers the percentage of the substance in the product up to 25 %.

Mixture/Article

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

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## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

---

### 2.11 Contributing scenario controlling worker exposure for: PROC5, Solid mixture

---

Activity : Process sampling

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Solid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness (of a measure): 90 %)

---

### 2.12 Contributing scenario controlling worker exposure for: PROC2, Solid mixture

---

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Solid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

---

### 2.13 Contributing scenario controlling worker exposure for: PROC4, PROC8a, PROC9, Solid mixture

---

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Solid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use



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## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.14 Contributing scenario controlling worker exposure for: PROC8b, Solid mixture

Activity : Process sampling

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.15 Contributing scenario controlling worker exposure for: PROC14, PROC15, Solid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## 2.16 Contributing scenario controlling worker exposure for: PROC19, Solid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

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Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
(Effectiveness (of a measure): 90 %)

### 3. Exposure estimation and reference to its source

#### Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure (PEC)	RCR
ERC2	EUSES		Fresh water		0.02 mg/l	0.88
			Fresh water sediment		0.20 mg/kg dry weight	0.88
			Marine water		0.002 mg/l	0.88
			Marine sediment		0.02 mg/kg dry weight	0.88
			Sewage treatment plant		0.2 mg/l	0.02
			Soil		0.03 mg/kg dry weight	0.85

#### Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PROC1, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.04 mg/m <sup>3</sup>	0.01
PROC1	TRA Workers 3.0		Inhalation: short-term, systemic	0.17 mg/m <sup>3</sup>	< 0.01
PROC1	TRA Workers 3.0		Dermal: long-term, systemic	0.02 mg/kg bw/d	< 0.01
PROC1	TRA Workers 3.0		Chronic dermal local exposure	0.006 mg/cm <sup>2</sup>	< 0.01
PROC1	TRA Workers 3.0		Dermal: acute, local	0.006 mg/cm <sup>2</sup>	< 0.01
PROC2, PROC3, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 1.26 mg/m <sup>3</sup>	<= 0.42
PROC2, PROC3	TRA Workers 3.0		Inhalation: short-term, systemic	5.05 mg/m <sup>3</sup>	<= 0.28
PROC2, PROC3	TRA Workers 3.0		Dermal: long-term, systemic	<= 0.82 mg/kg bw/day	<= 0.30
PROC2, PROC3	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC2, PROC3	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5, PROC8b, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m <sup>3</sup>	0.49
PROC5, PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m <sup>3</sup>	0.33
PROC5, PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/kg bw/day	0.31
PROC5, PROC8b	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5, PROC8b	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC15, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.10 mg/m <sup>3</sup>	0.70
PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	8.41 mg/cm <sup>2</sup>	0.47
PROC15	TRA Workers		Dermal: long-term,	0.20 mg/kg bw/day	0.08

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	3.0		systemic		
PROC15	TRA Workers 3.0		Chronic dermal local exposure	0.06 mg/cm2	0.04
PROC15	TRA Workers 3.0		Dermal: acute, local	0.06 mg/cm2	0.04
PROC2, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m³	0.23
PROC2	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m³	0.16
PROC2	TRA Workers 3.0		Dermal: long-term, systemic	0.14 mg/kg bw/day	0.05
PROC2	TRA Workers 3.0		Chronic dermal local exposure	0.02 mg/cm2	0.01
PROC2	TRA Workers 3.0		Dermal: acute, local	0.02 mg/cm2	0.01
PROC4, PROC8a, PROC8b, PROC9, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 0.70 mg/m³	<= 0.23
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Inhalation: short-term, systemic	<= 2.81 mg/m³	<= 0.16
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Dermal: long-term, systemic	<= 1.37 mg/kg bw/day	<= 0.51
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm2	0.06
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Dermal: acute, local	<= 0.1 mg/cm2	<= 0.06
PROC15, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.45 mg/m³	0.82
PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/m³	0.55
PROC15	TRA Workers 3.0		Dermal: long-term, systemic	0.03 mg/kg bw/d	0.01
PROC15	TRA Workers 3.0		Chronic dermal local exposure	0.01 mg/cm2	< 0.01
PROC15	TRA Workers 3.0		Dermal: acute, local	0.01 mg/cm2	< 0.01
PROC19, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m³	0.23
PROC19	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m³	0.16
PROC19	TRA Workers 3.0		Dermal: long-term, systemic	1.41 mg/kg bw/d	0.52
PROC19	TRA Workers 3.0		Chronic dermal local exposure	0.05 mg/cm2	0.03
PROC19	TRA Workers 3.0		Dermal: acute, local	0.05 mg/cm2	0.03
PROC3, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.26 mg/m³	0.42
PROC3	TRA Workers 3.0		Inhalation: short-term, systemic	5.05 mg/m³	0.28
PROC3	TRA Workers 3.0		Dermal: long-term, systemic	0.41 mg/kg bw/day	0.15
PROC3	TRA Workers 3.0		Chronic dermal local exposure	0.12 mg/cm2	0.08
PROC3	TRA Workers 3.0		Dermal: acute, local	0.12 mg/cm2	0.08
PROC5, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m³	0.49
PROC5	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m³	0.33
PROC5	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/kg bw/day	0.31
PROC5	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm2	<= 0.08

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PROC5	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC2, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC2	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC2	TRA Workers 3.0		Dermal: long-term, systemic	0.14 mg/kg bw/day	0.05
PROC2	TRA Workers 3.0		Chronic dermal local exposure	0.02 mg/cm <sup>2</sup>	0.01
PROC2	TRA Workers 3.0		Dermal: acute, local	0.02 mg/cm <sup>2</sup>	0.01
PROC4, PROC8a, PROC9, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 0.70 mg/m <sup>3</sup>	<= 0.23
PROC4, PROC8a, PROC9	TRA Workers 3.0		Inhalation: short-term, systemic	<= 2.81 mg/m <sup>3</sup>	<= 0.16
PROC4, PROC8a, PROC9	TRA Workers 3.0		Dermal: long-term, systemic	<= 1.37 mg/kg bw/day	<= 0.51
PROC4, PROC8a, PROC9	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC4, PROC8a, PROC9	TRA Workers 3.0		Dermal: acute, local	<= 0.1 mg/cm <sup>2</sup>	<= 0.06
PROC8b, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.25 mg/m <sup>3</sup>	0.08
PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	0.98 mg/m <sup>3</sup>	0.06
PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	1.37 mg/kg bw/day	0.51
PROC8b	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC8b	TRA Workers 3.0		Dermal: acute, local	0.1 mg/cm <sup>2</sup>	0.06
PROC14, PROC15, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.45 mg/m <sup>3</sup>	0.82
PROC14, PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/m <sup>3</sup>	0.55
PROC14, PROC15	TRA Workers 3.0		Dermal: long-term, systemic	<= 0.34 mg/kg bw/d	<= 0.13
PROC14, PROC15	TRA Workers 3.0		Chronic dermal local exposure	<= 0.05 mg/cm <sup>2</sup>	<= 0.03
PROC14, PROC15	TRA Workers 3.0		Dermal: acute, local	<= 0.05 mg/cm <sup>2</sup>	<= 0.03
PROC19, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC19	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC19	TRA Workers 3.0		Dermal: long-term, systemic	1.41 mg/kg bw/d	0.52
PROC19	TRA Workers 3.0		Chronic dermal local exposure	0.05 mg/cm <sup>2</sup>	0.03
PROC19	TRA Workers 3.0		Dermal: acute, local	0.05 mg/cm <sup>2</sup>	0.03

Further details on SpERCs, scaling, releases and control technologies are provided in IFRA Guidance "REACH Exposure Scenarios for Fragrance Substances"

For complete exposure estimation, the values for different routes of exposure and activities may have to be summed up.

assumes operating temperature: <= 40 °C

#### 4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

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EUSES = EUSES version 2.1.1

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**ES 8: Cosmetics Europe / COLIPA Formulation of Cosmetics: Fine Fragrances - Cleaning with Water (medium scale), Medium Viscosity Body Care Products (small scale), Non-liquid Creams (skin care, body care, mascara, solar oil, make-up foundation) (medium scale)**

## 1. Scenario description

Main User Groups	: <b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites
Chemical product category	: <b>PC28:</b> Perfumes, fragrances <b>PC39:</b> Cosmetics, personal care products
Process categories	: <b>PROC1:</b> Use in closed process, no likelihood of exposure <b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure <b>PROC3:</b> Use in closed batch process (synthesis or formulation) <b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises <b>PROC5:</b> Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) <b>PROC8a:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities <b>PROC8b:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities <b>PROC9:</b> Transfer of substance or preparation into small containers (dedicated filling line, including weighing) <b>PROC14:</b> Production of preparations or articles by tableting, compression, extrusion, pelletisation <b>PROC15:</b> Use as laboratory reagent <b>PROC19:</b> Hand-mixing with intimate contact and only PPE available
Environmental Release Categories	: <b>ERC2:</b> Formulation of preparations
Further information	: Cosmetics Europe / COLIPA

## 2.1 Contributing scenario controlling environmental exposure for: ERC2

### Product characteristics

Viscosity, dynamic	: 7.28 mPa.s (at 20 °C)
Annual amount per site (Msafe)	: 40.7 t
Remarks	: Msafe is the maximum amount of substance or product which may be used safely under the conditions defined in the environmental part of the exposure scenario.

### Frequency and duration of use

Continuous exposure	: 250 days/year
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### Environment factors not influenced by risk management

Flow rate of receiving surface water	: 18,000 m <sup>3</sup> /d
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## Other given operational conditions affecting environmental exposure

Emission or Release Factor: Air : 0.0 %  
Emission or Release Factor: Water : 2 %  
Emission or Release Factor: Soil : 0.0 %

## Technical conditions and measures / Organizational measures

Water : All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.

## Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant : Municipal sewage treatment plant  
Flow rate of sewage treatment plant effluent : 2,000 m3/d  
Effectiveness (of a measure) : 87.7 %  
Sludge Treatment : Can be applied on agricultural soil, when in compliance with local regulations.

## Conditions and measures related to external treatment of waste for disposal

Disposal methods : Dispose of as hazardous waste in compliance with local and national regulations.

---

## 2.2 Contributing scenario controlling worker exposure for: PROC1, Liquid mixture

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Activity : Product delivery/storage - product storage - indoor, Loading of application equipment - batch, indoor (liquid products)

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

---

## 2.3 Contributing scenario controlling worker exposure for: PROC2, PROC3, Liquid mixture

---

Activity : Process sampling

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

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### 2.4 Contributing scenario controlling worker exposure for: PROC5, PROC8b, Liquid mixture

Activity : Process sampling

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Liquid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

#### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

#### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness (of a measure): 90 %)

### 2.5 Contributing scenario controlling worker exposure for: PROC15, Liquid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Liquid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

#### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

### 2.6 Contributing scenario controlling worker exposure for: PROC2, Liquid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Liquid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### 2.7 Contributing scenario controlling worker exposure for: PROC4, PROC8a, PROC8b, PROC9, Liquid mixture



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### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.8 Contributing scenario controlling worker exposure for: PROC15, Liquid mixture

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## 2.9 Contributing scenario controlling worker exposure for: PROC19, Liquid mixture

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

(Effectiveness (of a measure): 90 %)

## 2.10 Contributing scenario controlling worker exposure for: PROC3, Solid mixture

Activity : Process sampling

### Product characteristics

Concentration of the Substance in : Covers the percentage of the substance in the product up to 25 %.

Mixture/Article

Physical Form (at time of use) : Solid mixture

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### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.11 Contributing scenario controlling worker exposure for: PROC5, Solid mixture

Activity : Process sampling

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness (of a measure): 90 %)

## 2.12 Contributing scenario controlling worker exposure for: PROC2, Solid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## 2.13 Contributing scenario controlling worker exposure for: PROC4, PROC8a, PROC9, Solid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

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## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

---

## 2.14 Contributing scenario controlling worker exposure for: PROC8b, Solid mixture

---

Activity : Process sampling

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

---

## 2.15 Contributing scenario controlling worker exposure for: PROC14, PROC15, Solid mixture

---

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

---

## 2.16 Contributing scenario controlling worker exposure for: PROC19, Solid mixture

---

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

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### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

(Effectiveness (of a measure): 90 %)

### 3. Exposure estimation and reference to its source

#### Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure (PEC)	RCR
ERC2	EUSES		Fresh water		0.02 mg/l	0.88
			Fresh water sediment		0.20 mg/kg dry weight	0.88
			Marine water		0.002 mg/l	0.88
			Marine sediment		0.02 mg/kg dry weight	0.88
			Sewage treatment plant		0.20 mg/l	0.02
			Soil		0.03 mg/kg dry weight	0.85

#### Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PROC1, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.04 mg/m <sup>3</sup>	0.01
PROC1	TRA Workers 3.0		Inhalation: short-term, systemic	0.17 mg/m <sup>3</sup>	< 0.01
PROC1	TRA Workers 3.0		Dermal: long-term, systemic	0.02 mg/kg bw/d	< 0.01
PROC1	TRA Workers 3.0		Chronic dermal local exposure	0.006 mg/cm <sup>2</sup>	< 0.01
PROC1	TRA Workers 3.0		Dermal: acute, local	0.006 mg/cm <sup>2</sup>	< 0.01
PROC2, PROC3, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 1.26 mg/m <sup>3</sup>	<= 0.42
PROC2, PROC3	TRA Workers 3.0		Inhalation: short-term, systemic	5.05 mg/m <sup>3</sup>	<= 0.28
PROC2, PROC3	TRA Workers 3.0		Dermal: long-term, systemic	<= 0.82 mg/kg bw/day	<= 0.30
PROC2, PROC3	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC2, PROC3	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5, PROC8b, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m <sup>3</sup>	0.49
PROC5, PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m <sup>3</sup>	0.33
PROC5, PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/kg bw/day	0.31
PROC5, PROC8b	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5, PROC8b	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC15, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.10 mg/m <sup>3</sup>	0.70
PROC15	TRA Workers		Inhalation: short-term,	8.41 mg/cm <sup>2</sup>	0.47

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PROC15	TRA Workers 3.0		Dermal: long-term, systemic	0.20 mg/kg bw/day	0.08
PROC15	TRA Workers 3.0		Chronic dermal local exposure	0.06 mg/cm2	0.04
PROC15	TRA Workers 3.0		Dermal: acute, local	0.06 mg/cm2	0.04
PROC2, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC2	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC2	TRA Workers 3.0		Dermal: long-term, systemic	0.14 mg/kg bw/day	0.05
PROC2	TRA Workers 3.0		Chronic dermal local exposure	0.02 mg/cm2	0.01
PROC2	TRA Workers 3.0		Dermal: acute, local	0.02 mg/cm2	0.01
PROC4, PROC8a, PROC8b, PROC9, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 0.70 mg/m <sup>3</sup>	<= 0.23
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Inhalation: short-term, systemic	<= 2.81 mg/m <sup>3</sup>	<= 0.16
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Dermal: long-term, systemic	<= 1.37 mg/kg bw/day	<= 0.51
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm2	0.06
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Dermal: acute, local	<= 0.1 mg/cm2	<= 0.06
PROC15, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.45 mg/m <sup>3</sup>	0.82
PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/m <sup>3</sup>	0.55
PROC15	TRA Workers 3.0		Dermal: long-term, systemic	0.03 mg/kg bw/d	0.01
PROC15	TRA Workers 3.0		Chronic dermal local exposure	0.01 mg/cm2	< 0.01
PROC15	TRA Workers 3.0		Dermal: acute, local	0.01 mg/cm2	< 0.01
PROC19, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC19	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC19	TRA Workers 3.0		Dermal: long-term, systemic	1.41 mg/kg bw/d	0.52
PROC19	TRA Workers 3.0		Chronic dermal local exposure	0.05 mg/cm2	0.03
PROC19	TRA Workers 3.0		Dermal: acute, local	0.05 mg/cm2	0.03
PROC3, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.26 mg/m <sup>3</sup>	0.42
PROC3	TRA Workers 3.0		Inhalation: short-term, systemic	5.05 mg/m <sup>3</sup>	0.28
PROC3	TRA Workers 3.0		Dermal: long-term, systemic	0.41 mg/kg bw/day	0.15
PROC3	TRA Workers 3.0		Chronic dermal local exposure	0.12 mg/cm2	0.08
PROC3	TRA Workers 3.0		Dermal: acute, local	0.12 mg/cm2	0.08
PROC5, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m <sup>3</sup>	0.49
PROC5	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m <sup>3</sup>	0.33
PROC5	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/kg bw/day	0.31

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PROC5	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm2	<= 0.08
PROC5	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm2	<= 0.08
PROC2, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m³	0.23
PROC2	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m³	0.16
PROC2	TRA Workers 3.0		Dermal: long-term, systemic	0.14 mg/kg bw/day	0.05
PROC2	TRA Workers 3.0		Chronic dermal local exposure	0.02 mg/cm2	0.01
PROC2	TRA Workers 3.0		Dermal: acute, local	0.02 mg/cm2	0.01
PROC4, PROC8a, PROC9, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 0.70 mg/m³	<= 0.23
PROC4, PROC8a, PROC9	TRA Workers 3.0		Inhalation: short-term, systemic	<= 2.81 mg/m³	<= 0.16
PROC4, PROC8a, PROC9	TRA Workers 3.0		Dermal: long-term, systemic	<= 1.37 mg/kg bw/day	<= 0.51
PROC4, PROC8a, PROC9	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm2	0.06
PROC4, PROC8a, PROC9	TRA Workers 3.0		Dermal: acute, local	<= 0.1 mg/cm2	<= 0.06
PROC8b, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.25 mg/m³	0.08
PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	0.98 mg/m³	0.06
PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	1.37 mg/kg bw/day	0.51
PROC8b	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm2	0.06
PROC8b	TRA Workers 3.0		Dermal: acute, local	0.1 mg/cm2	0.06
PROC14, PROC15, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.45 mg/m³	0.82
PROC14, PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/m³	0.55
PROC14, PROC15	TRA Workers 3.0		Dermal: long-term, systemic	<= 0.34 mg/kg bw/d	<= 0.13
PROC14, PROC15	TRA Workers 3.0		Chronic dermal local exposure	<= 0.05 mg/cm2	<= 0.03
PROC14, PROC15	TRA Workers 3.0		Dermal: acute, local	<= 0.05 mg/cm2	<= 0.03
PROC19, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m³	0.23
PROC19	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m³	0.16
PROC19	TRA Workers 3.0		Dermal: long-term, systemic	1.41 mg/kg bw/d	0.52
PROC19	TRA Workers 3.0		Chronic dermal local exposure	0.05 mg/cm2	0.03
PROC19	TRA Workers 3.0		Dermal: acute, local	0.05 mg/cm2	0.03

Further details on SpERCs, scaling, releases and control technologies are provided in IFRA Guidance "REACH Exposure Scenarios for Fragrance Substances"

For complete exposure estimation, the values for different routes of exposure and activities may have to be summed up.

assumes operating temperature: <= 40 °C

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## **4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario**

EUSES = EUSES version 2.1.1

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## **ES 9: Cosmetics Europe / COLIPA Formulation of Cosmetics: Fine Fragrances - Cleaning with Water (small scale)**

### **1. Scenario description**

Main User Groups	: <b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites
Chemical product category	: <b>PC28:</b> Perfumes, fragrances <b>PC39:</b> Cosmetics, personal care products
Process categories	: <b>PROC1:</b> Use in closed process, no likelihood of exposure <b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure <b>PROC3:</b> Use in closed batch process (synthesis or formulation) <b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises <b>PROC5:</b> Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) <b>PROC8a:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities <b>PROC8b:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities <b>PROC9:</b> Transfer of substance or preparation into small containers (dedicated filling line, including weighing) <b>PROC14:</b> Production of preparations or articles by tableting, compression, extrusion, pelletisation <b>PROC15:</b> Use as laboratory reagent <b>PROC19:</b> Hand-mixing with intimate contact and only PPE available
Environmental Release Categories	: <b>ERC2:</b> Formulation of preparations
Further information	: Cosmetics Europe / COLIPA

### **2.1 Contributing scenario controlling environmental exposure for: ERC2**

#### **Product characteristics**

Viscosity, dynamic	: 7.28 mPa.s (at 20 °C)
Annual amount per site (Msafe)	: 21.7 t
Remarks	: Msafe is the maximum amount of substance or product which may be used safely under the conditions defined in the environmental part of the exposure scenario.

#### **Frequency and duration of use**

Continuous exposure	: 250 days/year
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#### **Environment factors not influenced by risk management**

Flow rate of receiving surface water	: 18,000 m <sup>3</sup> /d
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#### **Other given operational conditions affecting environmental exposure**

Emission or Release Factor: Air	: 0.0 %
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Emission or Release Factor: Water : 1.5 %  
Emission or Release Factor: Soil : 0.0 %

### Technical conditions and measures / Organizational measures

Water : All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.

### Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant : Municipal sewage treatment plant  
Flow rate of sewage treatment : 2,000 m<sup>3</sup>/d  
plant effluent  
Effectiveness (of a measure) : 87.7 %  
Sludge Treatment : Can be applied on agricultural soil, when in compliance with local regulations.

### Conditions and measures related to external treatment of waste for disposal

Disposal methods : Dispose of as hazardous waste in compliance with local and national regulations.

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## 2.2 Contributing scenario controlling worker exposure for: PROC1, Liquid mixture

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Activity : Product delivery/storage - product storage - indoor, Loading of application equipment - batch, indoor (liquid products)

### Product characteristics

Concentration of the Substance in : Covers the percentage of the substance in the product up to  
Mixture/Article 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

---

## 2.3 Contributing scenario controlling worker exposure for: PROC2, PROC3, Liquid mixture

---

Activity : Process sampling

### Product characteristics

Concentration of the Substance in : Covers the percentage of the substance in the product up to  
Mixture/Article 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

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## 2.4 Contributing scenario controlling worker exposure for: PROC5, PROC8b, Liquid mixture

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Activity : Process sampling

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness (of a measure): 90 %)

## 2.5 Contributing scenario controlling worker exposure for: PROC15, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.6 Contributing scenario controlling worker exposure for: PROC2, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## 2.7 Contributing scenario controlling worker exposure for: PROC4, PROC8a, PROC8b, PROC9, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

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Mixture/Article

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.8 Contributing scenario controlling worker exposure for: PROC15, Liquid mixture

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## 2.9 Contributing scenario controlling worker exposure for: PROC19, Liquid mixture

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
(Effectiveness (of a measure): 90 %)

## 2.10 Contributing scenario controlling worker exposure for: PROC3, Solid mixture

Activity : Process sampling

### Product characteristics

Concentration of the Substance in : Covers the percentage of the substance in the product up to 25 %.

Mixture/Article

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

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## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

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### 2.11 Contributing scenario controlling worker exposure for: PROC5, Solid mixture

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Activity : Process sampling

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Solid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness (of a measure): 90 %)

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### 2.12 Contributing scenario controlling worker exposure for: PROC2, Solid mixture

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#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Solid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

---

### 2.13 Contributing scenario controlling worker exposure for: PROC4, PROC8a, PROC9, Solid mixture

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#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Solid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

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## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

### 2.14 Contributing scenario controlling worker exposure for: PROC8b, Solid mixture

Activity : Process sampling

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Solid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

#### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

### 2.15 Contributing scenario controlling worker exposure for: PROC14, PROC15, Solid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Solid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

#### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

### 2.16 Contributing scenario controlling worker exposure for: PROC19, Solid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Solid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

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Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
(Effectiveness (of a measure): 90 %)

### 3. Exposure estimation and reference to its source

#### Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure (PEC)	RCR
ERC2	EUSES		Fresh water		0.01 mg/l	0.44
			Fresh water sediment		0.01 mg/kg dry weight	0.45
			Marine water		0.001 mg/l	0.44
			Marine sediment		0.01 mg/kg dry weight	0.44
			Sewage treatment plant		0.1 mg/l	0.01
			Soil		0.01 mg/kg dry weight	0.42

#### Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PROC1, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.04 mg/m <sup>3</sup>	0.01
PROC1	TRA Workers 3.0		Inhalation: short-term, systemic	0.17 mg/m <sup>3</sup>	< 0.01
PROC1	TRA Workers 3.0		Dermal: long-term, systemic	0.02 mg/kg bw/d	< 0.01
PROC1	TRA Workers 3.0		Chronic dermal local exposure	0.006 mg/cm <sup>2</sup>	< 0.01
PROC1	TRA Workers 3.0		Dermal: acute, local	0.006 mg/cm <sup>2</sup>	< 0.01
PROC2, PROC3, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 1.26 mg/m <sup>3</sup>	<= 0.42
PROC2, PROC3	TRA Workers 3.0		Inhalation: short-term, systemic	5.05 mg/m <sup>3</sup>	<= 0.28
PROC2, PROC3	TRA Workers 3.0		Dermal: long-term, systemic	<= 0.82 mg/kg bw/day	<= 0.30
PROC2, PROC3	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC2, PROC3	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5, PROC8b, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m <sup>3</sup>	0.49
PROC5, PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m <sup>3</sup>	0.33
PROC5, PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/kg bw/day	0.31
PROC5, PROC8b	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5, PROC8b	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC15, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.10 mg/m <sup>3</sup>	0.70
PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	8.41 mg/cm <sup>2</sup>	0.47
PROC15	TRA Workers		Dermal: long-term,	0.20 mg/kg bw/day	0.08

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	3.0		systemic		
PROC15	TRA Workers 3.0		Chronic dermal local exposure	0.06 mg/cm <sup>2</sup>	0.04
PROC15	TRA Workers 3.0		Dermal: acute, local	0.06 mg/cm <sup>2</sup>	0.04
PROC2, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC2	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC2	TRA Workers 3.0		Dermal: long-term, systemic	0.14 mg/kg bw/day	0.05
PROC2	TRA Workers 3.0		Chronic dermal local exposure	0.02 mg/cm <sup>2</sup>	0.01
PROC2	TRA Workers 3.0		Dermal: acute, local	0.02 mg/cm <sup>2</sup>	0.01
PROC4, PROC8a, PROC8b, PROC9, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 0.70 mg/m <sup>3</sup>	<= 0.23
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Inhalation: short-term, systemic	<= 2.81 mg/m <sup>3</sup>	<= 0.16
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Dermal: long-term, systemic	<= 1.37 mg/kg bw/day	<= 0.51
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Dermal: acute, local	<= 0.1 mg/cm <sup>2</sup>	<= 0.06
PROC15, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.45 mg/m <sup>3</sup>	0.82
PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/m <sup>3</sup>	0.55
PROC15	TRA Workers 3.0		Dermal: long-term, systemic	0.03 mg/kg bw/d	0.01
PROC15	TRA Workers 3.0		Chronic dermal local exposure	0.01 mg/cm <sup>2</sup>	< 0.01
PROC15	TRA Workers 3.0		Dermal: acute, local	0.01 mg/cm <sup>2</sup>	< 0.01
PROC19, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC19	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC19	TRA Workers 3.0		Dermal: long-term, systemic	1.41 mg/kg bw/d	0.52
PROC19	TRA Workers 3.0		Chronic dermal local exposure	0.05 mg/cm <sup>2</sup>	0.03
PROC19	TRA Workers 3.0		Dermal: acute, local	0.05 mg/cm <sup>2</sup>	0.03
PROC3, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.26 mg/m <sup>3</sup>	0.42
PROC3	TRA Workers 3.0		Inhalation: short-term, systemic	5.05 mg/m <sup>3</sup>	0.28
PROC3	TRA Workers 3.0		Dermal: long-term, systemic	0.41 mg/kg bw/day	0.15
PROC3	TRA Workers 3.0		Chronic dermal local exposure	0.12 mg/cm <sup>2</sup>	0.08
PROC3	TRA Workers 3.0		Dermal: acute, local	0.12 mg/cm <sup>2</sup>	0.08
PROC5, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m <sup>3</sup>	0.49
PROC5	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m <sup>3</sup>	0.33
PROC5	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/kg bw/day	0.31
PROC5	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08

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PROC5	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC2, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC2	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC2	TRA Workers 3.0		Dermal: long-term, systemic	0.14 mg/kg bw/day	0.05
PROC2	TRA Workers 3.0		Chronic dermal local exposure	0.02 mg/cm <sup>2</sup>	0.01
PROC2	TRA Workers 3.0		Dermal: acute, local	0.02 mg/cm <sup>2</sup>	0.01
PROC4, PROC8a, PROC9, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 0.70 mg/m <sup>3</sup>	<= 0.23
PROC4, PROC8a, PROC9	TRA Workers 3.0		Inhalation: short-term, systemic	<= 2.81 mg/m <sup>3</sup>	<= 0.16
PROC4, PROC8a, PROC9	TRA Workers 3.0		Dermal: long-term, systemic	<= 1.37 mg/kg bw/day	<= 0.51
PROC4, PROC8a, PROC9	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC4, PROC8a, PROC9	TRA Workers 3.0		Dermal: acute, local	<= 0.1 mg/cm <sup>2</sup>	<= 0.06
PROC8b, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.25 mg/m <sup>3</sup>	0.08
PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	0.98 mg/m <sup>3</sup>	0.06
PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	1.37 mg/kg bw/day	0.51
PROC8b	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC8b	TRA Workers 3.0		Dermal: acute, local	0.1 mg/cm <sup>2</sup>	0.06
PROC14, PROC15, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.45 mg/m <sup>3</sup>	0.82
PROC14, PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/m <sup>3</sup>	0.55
PROC14, PROC15	TRA Workers 3.0		Dermal: long-term, systemic	<= 0.34 mg/kg bw/d	<= 0.13
PROC14, PROC15	TRA Workers 3.0		Chronic dermal local exposure	<= 0.05 mg/cm <sup>2</sup>	<= 0.03
PROC14, PROC15	TRA Workers 3.0		Dermal: acute, local	<= 0.05 mg/cm <sup>2</sup>	<= 0.03
PROC19, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC19	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC19	TRA Workers 3.0		Dermal: long-term, systemic	1.41 mg/kg bw/d	0.52
PROC19	TRA Workers 3.0		Chronic dermal local exposure	0.05 mg/cm <sup>2</sup>	0.03
PROC19	TRA Workers 3.0		Dermal: acute, local	0.05 mg/cm <sup>2</sup>	0.03

Further details on SpERCs, scaling, releases and control technologies are provided in IFRA Guidance "REACH Exposure Scenarios for Fragrance Substances"

For complete exposure estimation, the values for different routes of exposure and activities may have to be summed up.

assumes operating temperature: <= 40 °C

#### 4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario



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EUSES = EUSES version 2.1.1

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**ES 10: Cosmetics Europe / COLIPA Formulation of cosmetic products involving cleaning with Organic Solvents (Varnish / Removers, Decorative Cosmetics, Spray, Lacquer, Fine Fragrance, Solar oil, solid products)**

## 1. Scenario description

Main User Groups	: <b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites
Chemical product category	: <b>PC28:</b> Perfumes, fragrances <b>PC39:</b> Cosmetics, personal care products
Process categories	: <b>PROC1:</b> Use in closed process, no likelihood of exposure <b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure <b>PROC3:</b> Use in closed batch process (synthesis or formulation) <b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises <b>PROC5:</b> Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) <b>PROC8a:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities <b>PROC8b:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities <b>PROC9:</b> Transfer of substance or preparation into small containers (dedicated filling line, including weighing) <b>PROC14:</b> Production of preparations or articles by tableting, compression, extrusion, pelletisation <b>PROC15:</b> Use as laboratory reagent <b>PROC19:</b> Hand-mixing with intimate contact and only PPE available
Environmental Release Categories	: <b>ERC2:</b> Formulation of preparations
Further information	: Cosmetics Europe / COLIPA

## 2.1 Contributing scenario controlling environmental exposure for: ERC2

### Product characteristics

Viscosity, dynamic	: 7.28 mPa.s (at 20 °C)
Annual amount per site (Msafe)	: 100 kg
Remarks	: Msafe is the maximum amount of substance or product which may be used safely under the conditions defined in the environmental part of the exposure scenario.

### Frequency and duration of use

Continuous exposure	: 250 days/year
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### Environment factors not influenced by risk management

Flow rate of receiving surface water	: 18,000 m <sup>3</sup> /d
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### Other given operational conditions affecting environmental exposure

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Emission or Release Factor: Air : 0.0 %  
Emission or Release Factor: Water : 0.0 %  
Emission or Release Factor: Soil : 0.0 %

### Technical conditions and measures / Organizational measures

Water : All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.

### Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant : Municipal sewage treatment plant  
Flow rate of sewage treatment : 2,000 m3/d  
plant effluent  
Effectiveness (of a measure) : 87.7 %  
Sludge Treatment : Can be applied on agricultural soil, when in compliance with local regulations.

### Conditions and measures related to external treatment of waste for disposal

Disposal methods : Dispose of as hazardous waste in compliance with local and national regulations.

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## 2.2 Contributing scenario controlling worker exposure for: PROC1, Liquid mixture

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Activity : Product delivery/storage - product storage - indoor, Loading of application equipment - batch, indoor (liquid products)

### Product characteristics

Concentration of the Substance in : Covers the percentage of the substance in the product up to  
Mixture/Article 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

---

## 2.3 Contributing scenario controlling worker exposure for: PROC2, PROC3, Liquid mixture

---

Activity : Process sampling

### Product characteristics

Concentration of the Substance in : Covers the percentage of the substance in the product up to  
Mixture/Article 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

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### 2.4 Contributing scenario controlling worker exposure for: PROC5, PROC8b, Liquid mixture

Activity : Process sampling

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Liquid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

#### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

#### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness (of a measure): 90 %)

### 2.5 Contributing scenario controlling worker exposure for: PROC15, Liquid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Liquid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

#### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

### 2.6 Contributing scenario controlling worker exposure for: PROC2, Liquid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Liquid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### 2.7 Contributing scenario controlling worker exposure for: PROC4, PROC8a, PROC8b, PROC9, Liquid mixture

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### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.8 Contributing scenario controlling worker exposure for: PROC15, Liquid mixture

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## 2.9 Contributing scenario controlling worker exposure for: PROC19, Liquid mixture

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

(Effectiveness (of a measure): 90 %)

## 2.10 Contributing scenario controlling worker exposure for: PROC3, Solid mixture

Activity : Process sampling

### Product characteristics

Concentration of the Substance in : Covers the percentage of the substance in the product up to 25 %.

Mixture/Article

Physical Form (at time of use) : Solid mixture

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## Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

### 2.11 Contributing scenario controlling worker exposure for: PROC5, Solid mixture

Activity : Process sampling

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Solid mixture

## Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)  
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
(Effectiveness (of a measure): 90 %)

### 2.12 Contributing scenario controlling worker exposure for: PROC2, Solid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Solid mixture

## Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### 2.13 Contributing scenario controlling worker exposure for: PROC4, PROC8a, PROC9, Solid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Solid mixture

## Frequency and duration of use

Frequency of use : <= 8 hours/day

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## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

---

## 2.14 Contributing scenario controlling worker exposure for: PROC8b, Solid mixture

---

Activity : Process sampling

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

---

## 2.15 Contributing scenario controlling worker exposure for: PROC14, PROC15, Solid mixture

---

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

---

## 2.16 Contributing scenario controlling worker exposure for: PROC19, Solid mixture

---

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

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### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

(Effectiveness (of a measure): 90 %)

### 3. Exposure estimation and reference to its source

#### Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure (PEC)	RCR
ERC2	EUSES		Fresh water		0.0002 mg/l	< 0.01
			Fresh water sediment		0.002 mg/kg dry weight	< 0.01
			Marine water		0.00002 mg/l	< 0.01
			Marine sediment		0.0002 mg/kg dry weight	< 0.01
			Sewage treatment plant		0 mg/l	< 0.01
			Soil		0.00001 mg/kg dry weight	< 0.01

#### Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PROC1, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.04 mg/m <sup>3</sup>	0.01
PROC1	TRA Workers 3.0		Inhalation: short-term, systemic	0.17 mg/m <sup>3</sup>	< 0.01
PROC1	TRA Workers 3.0		Dermal: long-term, systemic	0.02 mg/kg bw/d	< 0.01
PROC1	TRA Workers 3.0		Chronic dermal local exposure	0.006 mg/cm <sup>2</sup>	< 0.01
PROC1	TRA Workers 3.0		Dermal: acute, local	0.006 mg/cm <sup>2</sup>	< 0.01
PROC2, PROC3, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 1.26 mg/m <sup>3</sup>	<= 0.42
PROC2, PROC3	TRA Workers 3.0		Inhalation: short-term, systemic	5.05 mg/m <sup>3</sup>	<= 0.28
PROC2, PROC3	TRA Workers 3.0		Dermal: long-term, systemic	<= 0.82 mg/kg bw/day	<= 0.30
PROC2, PROC3	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC2, PROC3	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5, PROC8b, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m <sup>3</sup>	0.49
PROC5, PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m <sup>3</sup>	0.33
PROC5, PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/kg bw/day	0.31
PROC5, PROC8b	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5, PROC8b	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC15, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.10 mg/m <sup>3</sup>	0.70
PROC15	TRA Workers		Inhalation: short-term,	8.41 mg/cm <sup>2</sup>	0.47



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	3.0		systemic		
PROC15	TRA Workers 3.0		Dermal: long-term, systemic	0.20 mg/kg bw/day	0.08
PROC15	TRA Workers 3.0		Chronic dermal local exposure	0.06 mg/cm2	0.04
PROC15	TRA Workers 3.0		Dermal: acute, local	0.06 mg/cm2	0.04
PROC2, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m3	0.23
PROC2	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m3	0.16
PROC2	TRA Workers 3.0		Dermal: long-term, systemic	0.14 mg/kg bw/day	0.05
PROC2	TRA Workers 3.0		Chronic dermal local exposure	0.02 mg/cm2	0.01
PROC2	TRA Workers 3.0		Dermal: acute, local	0.02 mg/cm2	0.01
PROC4, PROC8a, PROC8b, PROC9, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 0.70 mg/m3	<= 0.23
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Inhalation: short-term, systemic	<= 2.81 mg/m3	<= 0.16
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Dermal: long-term, systemic	<= 1.37 mg/kg bw/day	<= 0.51
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm2	0.06
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Dermal: acute, local	<= 0.1 mg/cm2	<= 0.06
PROC15, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.45 mg/m3	0.82
PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/m3	0.55
PROC15	TRA Workers 3.0		Dermal: long-term, systemic	0.03 mg/kg bw/d	0.01
PROC15	TRA Workers 3.0		Chronic dermal local exposure	0.01 mg/cm2	< 0.01
PROC15	TRA Workers 3.0		Dermal: acute, local	0.01 mg/cm2	< 0.01
PROC19, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m3	0.23
PROC19	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m3	0.16
PROC19	TRA Workers 3.0		Dermal: long-term, systemic	1.41 mg/kg bw/d	0.52
PROC19	TRA Workers 3.0		Chronic dermal local exposure	0.05 mg/cm2	0.03
PROC19	TRA Workers 3.0		Dermal: acute, local	0.05 mg/cm2	0.03
PROC3, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.26 mg/m3	0.42
PROC3	TRA Workers 3.0		Inhalation: short-term, systemic	5.05 mg/m3	0.28
PROC3	TRA Workers 3.0		Dermal: long-term, systemic	0.41 mg/kg bw/day	0.15
PROC3	TRA Workers 3.0		Chronic dermal local exposure	0.12 mg/cm2	0.08
PROC3	TRA Workers 3.0		Dermal: acute, local	0.12 mg/cm2	0.08
PROC5, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m3	0.49
PROC5	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m3	0.33
PROC5	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/kg bw/day	0.31

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PROC5	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC2, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC2	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC2	TRA Workers 3.0		Dermal: long-term, systemic	0.14 mg/kg bw/day	0.05
PROC2	TRA Workers 3.0		Chronic dermal local exposure	0.02 mg/cm <sup>2</sup>	0.01
PROC2	TRA Workers 3.0		Dermal: acute, local	0.02 mg/cm <sup>2</sup>	0.01
PROC4, PROC8a, PROC9, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 0.70 mg/m <sup>3</sup>	<= 0.23
PROC4, PROC8a, PROC9	TRA Workers 3.0		Inhalation: short-term, systemic	<= 2.81 mg/m <sup>3</sup>	<= 0.16
PROC4, PROC8a, PROC9	TRA Workers 3.0		Dermal: long-term, systemic	<= 1.37 mg/kg bw/day	<= 0.51
PROC4, PROC8a, PROC9	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC4, PROC8a, PROC9	TRA Workers 3.0		Dermal: acute, local	<= 0.1 mg/cm <sup>2</sup>	<= 0.06
PROC8b, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.25 mg/m <sup>3</sup>	0.08
PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	0.98 mg/m <sup>3</sup>	0.06
PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	1.37 mg/kg bw/day	0.51
PROC8b	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC8b	TRA Workers 3.0		Dermal: acute, local	0.1 mg/cm <sup>2</sup>	0.06
PROC14, PROC15, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.45 mg/m <sup>3</sup>	0.82
PROC14, PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/m <sup>3</sup>	0.55
PROC14, PROC15	TRA Workers 3.0		Dermal: long-term, systemic	<= 0.34 mg/kg bw/d	<= 0.13
PROC14, PROC15	TRA Workers 3.0		Chronic dermal local exposure	<= 0.05 mg/cm <sup>2</sup>	<= 0.03
PROC14, PROC15	TRA Workers 3.0		Dermal: acute, local	<= 0.05 mg/cm <sup>2</sup>	<= 0.03
PROC19, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC19	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC19	TRA Workers 3.0		Dermal: long-term, systemic	1.41 mg/kg bw/d	0.52
PROC19	TRA Workers 3.0		Chronic dermal local exposure	0.05 mg/cm <sup>2</sup>	0.03
PROC19	TRA Workers 3.0		Dermal: acute, local	0.05 mg/cm <sup>2</sup>	0.03

Further details on SpERCs, scaling, releases and control technologies are provided in IFRA Guidance "REACH Exposure Scenarios for Fragrance Substances"

For complete exposure estimation, the values for different routes of exposure and activities may have to be summed up.

assumes operating temperature: <= 40 °C

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## **4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario**

EUSES = EUSES version 2.1.1

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## ES 11: Cosmetics Europe / COLIPA Formulation of body care soap (small scale)

### 1. Scenario description

Main User Groups	: <b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites
Chemical product category	: <b>PC28:</b> Perfumes, fragrances <b>PC39:</b> Cosmetics, personal care products
Process categories	: <b>PROC1:</b> Use in closed process, no likelihood of exposure <b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure <b>PROC3:</b> Use in closed batch process (synthesis or formulation) <b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises <b>PROC5:</b> Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) <b>PROC8a:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities <b>PROC8b:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities <b>PROC9:</b> Transfer of substance or preparation into small containers (dedicated filling line, including weighing) <b>PROC14:</b> Production of preparations or articles by tableting, compression, extrusion, pelletisation <b>PROC15:</b> Use as laboratory reagent <b>PROC19:</b> Hand-mixing with intimate contact and only PPE available
Environmental Release Categories	: <b>ERC2:</b> Formulation of preparations
Further information	: Cosmetics Europe / COLIPA

### 2.1 Contributing scenario controlling environmental exposure for: ERC2

#### Product characteristics

Viscosity, dynamic	: 7.28 mPa.s (at 20 °C)
Annual amount per site (Msafe)	: 37 t
Remarks	: Msafe is the maximum amount of substance or product which may be used safely under the conditions defined in the environmental part of the exposure scenario.

#### Frequency and duration of use

Continuous exposure	: 250 days/year
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#### Environment factors not influenced by risk management

Flow rate of receiving surface water	: 18,000 m <sup>3</sup> /d
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#### Other given operational conditions affecting environmental exposure

Emission or Release Factor: Air	: 0.0 %
Emission or Release Factor: Water	: 0.2 %

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Emission or Release Factor: Soil : 0.0 %

### Technical conditions and measures / Organizational measures

Water : All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.

### Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant : Municipal sewage treatment plant  
Flow rate of sewage treatment plant effluent : 2,000 m3/d  
Effectiveness (of a measure) : 87.7 %  
Sludge Treatment : Can be applied on agricultural soil, when in compliance with local regulations.

### Conditions and measures related to external treatment of waste for disposal

Disposal methods : Dispose of as hazardous waste in compliance with local and national regulations.

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## 2.2 Contributing scenario controlling worker exposure for: PROC1, Liquid mixture

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Activity : Product delivery/storage - product storage - indoor, Loading of application equipment - batch, indoor (liquid products)

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

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## 2.3 Contributing scenario controlling worker exposure for: PROC2, PROC3, Liquid mixture

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Activity : Process sampling

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

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## 2.4 Contributing scenario controlling worker exposure for: PROC5, PROC8b, Liquid mixture

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Activity : Process sampling

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness (of a measure): 90 %)

## 2.5 Contributing scenario controlling worker exposure for: PROC15, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.6 Contributing scenario controlling worker exposure for: PROC2, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## 2.7 Contributing scenario controlling worker exposure for: PROC4, PROC8a, PROC8b, PROC9, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

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Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.8 Contributing scenario controlling worker exposure for: PROC15, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## 2.9 Contributing scenario controlling worker exposure for: PROC19, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness (of a measure): 90 %)

## 2.10 Contributing scenario controlling worker exposure for: PROC3, Solid mixture

Activity : Process sampling

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

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## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.11 Contributing scenario controlling worker exposure for: PROC5, Solid mixture

Activity : Process sampling

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness (of a measure): 90 %)

## 2.12 Contributing scenario controlling worker exposure for: PROC2, Solid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## 2.13 Contributing scenario controlling worker exposure for: PROC4, PROC8a, PROC9, Solid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use



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### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

### 2.14 Contributing scenario controlling worker exposure for: PROC8b, Solid mixture

Activity : Process sampling

#### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Solid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

#### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

### 2.15 Contributing scenario controlling worker exposure for: PROC14, PROC15, Solid mixture

#### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Solid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

#### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

### 2.16 Contributing scenario controlling worker exposure for: PROC19, Solid mixture

#### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Solid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

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(Effectiveness (of a measure): 90 %)

### 3. Exposure estimation and reference to its source

#### Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure (PEC)	RCR
ERC2	EUSES		Fresh water		0.02 mg/l	0.09
			Fresh water sediment		0.02 mg/kg dry weight	0.09
			Marine water		0.0002 mg/l	0.09
			Marine sediment		0.002 mg/kg dry weight	0.09
			Sewage treatment plant		0.02 mg/l	< 0.01
			Soil		0.002 mg/kg dry weight	0.08

#### Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PROC1, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.04 mg/m <sup>3</sup>	0.01
PROC1	TRA Workers 3.0		Inhalation: short-term, systemic	0.17 mg/m <sup>3</sup>	< 0.01
PROC1	TRA Workers 3.0		Dermal: long-term, systemic	0.02 mg/kg bw/d	< 0.01
PROC1	TRA Workers 3.0		Chronic dermal local exposure	0.006 mg/cm <sup>2</sup>	< 0.01
PROC1	TRA Workers 3.0		Dermal: acute, local	0.006 mg/cm <sup>2</sup>	< 0.01
PROC2, PROC3, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 1.26 mg/m <sup>3</sup>	<= 0.42
PROC2, PROC3	TRA Workers 3.0		Inhalation: short-term, systemic	5.05 mg/m <sup>3</sup>	<= 0.28
PROC2, PROC3	TRA Workers 3.0		Dermal: long-term, systemic	<= 0.82 mg/kg bw/day	<= 0.30
PROC2, PROC3	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC2, PROC3	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5, PROC8b, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m <sup>3</sup>	0.49
PROC5, PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m <sup>3</sup>	0.33
PROC5, PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/kg bw/day	0.31
PROC5, PROC8b	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5, PROC8b	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC15, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.10 mg/m <sup>3</sup>	0.70
PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	8.41 mg/cm <sup>2</sup>	0.47
PROC15	TRA Workers 3.0		Dermal: long-term, systemic	0.20 mg/kg bw/day	0.08

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PROC15	TRA Workers 3.0		Chronic dermal local exposure	0.06 mg/cm <sup>2</sup>	0.04
PROC15	TRA Workers 3.0		Dermal: acute, local	0.06 mg/cm <sup>2</sup>	0.04
PROC2, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC2	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC2	TRA Workers 3.0		Dermal: long-term, systemic	0.14 mg/kg bw/day	0.05
PROC2	TRA Workers 3.0		Chronic dermal local exposure	0.02 mg/cm <sup>2</sup>	0.01
PROC2	TRA Workers 3.0		Dermal: acute, local	0.02 mg/cm <sup>2</sup>	0.01
PROC4, PROC8a, PROC8b, PROC9, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 0.70 mg/m <sup>3</sup>	<= 0.23
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Inhalation: short-term, systemic	<= 2.81 mg/m <sup>3</sup>	<= 0.16
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Dermal: long-term, systemic	<= 1.37 mg/kg bw/day	<= 0.51
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Dermal: acute, local	<= 0.1 mg/cm <sup>2</sup>	<= 0.06
PROC15, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.45 mg/m <sup>3</sup>	0.82
PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/m <sup>3</sup>	0.55
PROC15	TRA Workers 3.0		Dermal: long-term, systemic	0.03 mg/kg bw/d	0.01
PROC15	TRA Workers 3.0		Chronic dermal local exposure	0.01 mg/cm <sup>2</sup>	< 0.01
PROC15	TRA Workers 3.0		Dermal: acute, local	0.01 mg/cm <sup>2</sup>	< 0.01
PROC19, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC19	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC19	TRA Workers 3.0		Dermal: long-term, systemic	1.41 mg/kg bw/d	0.52
PROC19	TRA Workers 3.0		Chronic dermal local exposure	0.05 mg/cm <sup>2</sup>	0.03
PROC19	TRA Workers 3.0		Dermal: acute, local	0.05 mg/cm <sup>2</sup>	0.03
PROC3, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.26 mg/m <sup>3</sup>	0.42
PROC3	TRA Workers 3.0		Inhalation: short-term, systemic	5.05 mg/m <sup>3</sup>	0.28
PROC3	TRA Workers 3.0		Dermal: long-term, systemic	0.41 mg/kg bw/day	0.15
PROC3	TRA Workers 3.0		Chronic dermal local exposure	0.12 mg/cm <sup>2</sup>	0.08
PROC3	TRA Workers 3.0		Dermal: acute, local	0.12 mg/cm <sup>2</sup>	0.08
PROC5, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m <sup>3</sup>	0.49
PROC5	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m <sup>3</sup>	0.33
PROC5	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/kg bw/day	0.31
PROC5	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08

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PROC2, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC2	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC2	TRA Workers 3.0		Dermal: long-term, systemic	0.14 mg/kg bw/day	0.05
PROC2	TRA Workers 3.0		Chronic dermal local exposure	0.02 mg/cm <sup>2</sup>	0.01
PROC2	TRA Workers 3.0		Dermal: acute, local	0.02 mg/cm <sup>2</sup>	0.01
PROC4, PROC8a, PROC9, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 0.70 mg/m <sup>3</sup>	<= 0.23
PROC4, PROC8a, PROC9	TRA Workers 3.0		Inhalation: short-term, systemic	<= 2.81 mg/m <sup>3</sup>	<= 0.16
PROC4, PROC8a, PROC9	TRA Workers 3.0		Dermal: long-term, systemic	<= 1.37 mg/kg bw/day	<= 0.51
PROC4, PROC8a, PROC9	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC4, PROC8a, PROC9	TRA Workers 3.0		Dermal: acute, local	<= 0.1 mg/cm <sup>2</sup>	<= 0.06
PROC8b, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.25 mg/m <sup>3</sup>	0.08
PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	0.98 mg/m <sup>3</sup>	0.06
PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	1.37 mg/kg bw/day	0.51
PROC8b	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC8b	TRA Workers 3.0		Dermal: acute, local	0.1 mg/cm <sup>2</sup>	0.06
PROC14, PROC15, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.45 mg/m <sup>3</sup>	0.82
PROC14, PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/m <sup>3</sup>	0.55
PROC14, PROC15	TRA Workers 3.0		Dermal: long-term, systemic	<= 0.34 mg/kg bw/d	<= 0.13
PROC14, PROC15	TRA Workers 3.0		Chronic dermal local exposure	<= 0.05 mg/cm <sup>2</sup>	<= 0.03
PROC14, PROC15	TRA Workers 3.0		Dermal: acute, local	<= 0.05 mg/cm <sup>2</sup>	<= 0.03
PROC19, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC19	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC19	TRA Workers 3.0		Dermal: long-term, systemic	1.41 mg/kg bw/d	0.52
PROC19	TRA Workers 3.0		Chronic dermal local exposure	0.05 mg/cm <sup>2</sup>	0.03
PROC19	TRA Workers 3.0		Dermal: acute, local	0.05 mg/cm <sup>2</sup>	0.03

Further details on SpERCs, scaling, releases and control technologies are provided in IFRA Guidance "REACH Exposure Scenarios for Fragrance Substances"

For complete exposure estimation, the values for different routes of exposure and activities may have to be summed up.

assumes operating temperature: <= 40 °C

#### 4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

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EUSES = EUSES version 2.1.1

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## **ES 12: Formulation of Detergents/Maintenance Products: Granular Regular (large scale), Granular Compact (small scale), Low Viscosity Liquids (large scale) (AISE)**

### **1. Scenario description**

Main User Groups	: <b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites
Chemical product category	: <b>PC28:</b> Perfumes, fragrances <b>PC31:</b> Polishes and wax blends <b>PC35:</b> Washing and cleaning products (including solvent based products)
Process categories	: <b>PROC1:</b> Use in closed process, no likelihood of exposure <b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure <b>PROC3:</b> Use in closed batch process (synthesis or formulation) <b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises <b>PROC5:</b> Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) <b>PROC8a:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities <b>PROC8b:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities <b>PROC9:</b> Transfer of substance or preparation into small containers (dedicated filling line, including weighing) <b>PROC14:</b> Production of preparations or articles by tableting, compression, extrusion, pelletisation <b>PROC15:</b> Use as laboratory reagent <b>PROC19:</b> Hand-mixing with intimate contact and only PPE available
Environmental Release Categories	: <b>ERC2:</b> Formulation of preparations
Further information	: Cosmetics Europe / COLIPA

### **2.1 Contributing scenario controlling environmental exposure for: ERC2**

#### **Product characteristics**

Viscosity, dynamic	: 7.28 mPa.s (at 20 °C)
Annual amount per site (Msafe)	: 850 t
Remarks	: Msafe is the maximum amount of substance or product which may be used safely under the conditions defined in the environmental part of the exposure scenario.

#### **Frequency and duration of use**

Continuous exposure	: 250 days/year
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#### **Environment factors not influenced by risk management**

Flow rate of receiving surface water	: 18,000 m <sup>3</sup> /d
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### Other given operational conditions affecting environmental exposure

Emission or Release Factor: Air : 0.0 %  
Emission or Release Factor: Water : 0.1 %  
Emission or Release Factor: Soil : 0.0 %

### Technical conditions and measures / Organizational measures

Water : All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.

### Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant : Municipal sewage treatment plant  
Flow rate of sewage treatment plant effluent : 2,000 m<sup>3</sup>/d  
Effectiveness (of a measure) : 87.7 %  
Sludge Treatment : Can be applied on agricultural soil, when in compliance with local regulations.

### Conditions and measures related to external treatment of waste for disposal

Disposal methods : Dispose of as hazardous waste in compliance with local and national regulations.

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## 2.2 Contributing scenario controlling worker exposure for: PROC1, Liquid mixture

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Activity : Product delivery/storage - product storage - indoor, Loading of application equipment - batch, indoor (liquid products)

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

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## 2.3 Contributing scenario controlling worker exposure for: PROC2, PROC3, Liquid mixture

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Activity : Process sampling

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

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### 2.4 Contributing scenario controlling worker exposure for: PROC5, PROC8b, Liquid mixture

Activity : Process sampling

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Liquid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

#### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

#### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness (of a measure): 90 %)

### 2.5 Contributing scenario controlling worker exposure for: PROC15, Liquid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Liquid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

#### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

### 2.6 Contributing scenario controlling worker exposure for: PROC2, Liquid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Liquid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### 2.7 Contributing scenario controlling worker exposure for: PROC4, PROC8a, PROC8b, PROC9, Liquid mixture



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### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.8 Contributing scenario controlling worker exposure for: PROC15, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## 2.9 Contributing scenario controlling worker exposure for: PROC19, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)  
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
(Effectiveness (of a measure): 90 %)

## 2.10 Contributing scenario controlling worker exposure for: PROC3, Solid mixture

Activity : Process sampling

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Solid mixture

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### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.11 Contributing scenario controlling worker exposure for: PROC5, Solid mixture

Activity : Process sampling

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness (of a measure): 90 %)

## 2.12 Contributing scenario controlling worker exposure for: PROC2, Solid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## 2.13 Contributing scenario controlling worker exposure for: PROC4, PROC8a, PROC9, Solid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

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## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

---

## 2.14 Contributing scenario controlling worker exposure for: PROC8b, Solid mixture

---

Activity : Process sampling

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

---

## 2.15 Contributing scenario controlling worker exposure for: PROC14, PROC15, Solid mixture

---

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

---

## 2.16 Contributing scenario controlling worker exposure for: PROC19, Solid mixture

---

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

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### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

(Effectiveness (of a measure): 90 %)

### 3. Exposure estimation and reference to its source

#### Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure (PEC)	RCR
ERC2	EUSES		Fresh water		0.02 mg/l	0.92
			Fresh water sediment		0.21 mg/kg dry weight	0.92
			Marine water		0.002 mg/l	0.92
			Marine sediment		0.02 mg/kg dry weight	0.92
			Sewage treatment plant		0.21 mg/l	0.02
			Soil		0.03 mg/kg dry weight	0.88

#### Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PROC1, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.04 mg/m <sup>3</sup>	0.01
PROC1	TRA Workers 3.0		Inhalation: short-term, systemic	0.17 mg/m <sup>3</sup>	< 0.01
PROC1	TRA Workers 3.0		Dermal: long-term, systemic	0.02 mg/kg bw/d	< 0.01
PROC1	TRA Workers 3.0		Chronic dermal local exposure	0.006 mg/cm <sup>2</sup>	< 0.01
PROC1	TRA Workers 3.0		Dermal: acute, local	0.006 mg/cm <sup>2</sup>	< 0.01
PROC2, PROC3, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 1.26 mg/m <sup>3</sup>	<= 0.42
PROC2, PROC3	TRA Workers 3.0		Inhalation: short-term, systemic	5.05 mg/m <sup>3</sup>	<= 0.28
PROC2, PROC3	TRA Workers 3.0		Dermal: long-term, systemic	<= 0.82 mg/kg bw/day	<= 0.30
PROC2, PROC3	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC2, PROC3	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5, PROC8b, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m <sup>3</sup>	0.49
PROC5, PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m <sup>3</sup>	0.33
PROC5, PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/kg bw/day	0.31
PROC5, PROC8b	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5, PROC8b	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC15, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.10 mg/m <sup>3</sup>	0.70
PROC15	TRA Workers		Inhalation: short-term,	8.41 mg/cm <sup>2</sup>	0.47

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	3.0		systemic		
PROC15	TRA Workers 3.0		Dermal: long-term, systemic	0.20 mg/kg bw/day	0.08
PROC15	TRA Workers 3.0		Chronic dermal local exposure	0.06 mg/cm2	0.04
PROC15	TRA Workers 3.0		Dermal: acute, local	0.06 mg/cm2	0.04
PROC2, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC2	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC2	TRA Workers 3.0		Dermal: long-term, systemic	0.14 mg/kg bw/day	0.05
PROC2	TRA Workers 3.0		Chronic dermal local exposure	0.02 mg/cm2	0.01
PROC2	TRA Workers 3.0		Dermal: acute, local	0.02 mg/cm2	0.01
PROC4, PROC8a, PROC8b, PROC9, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 0.70 mg/m <sup>3</sup>	<= 0.23
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Inhalation: short-term, systemic	<= 2.81 mg/m <sup>3</sup>	<= 0.16
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Dermal: long-term, systemic	<= 1.37 mg/kg bw/day	<= 0.51
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm2	0.06
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Dermal: acute, local	<= 0.1 mg/cm2	<= 0.06
PROC15, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.45 mg/m <sup>3</sup>	0.82
PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/m <sup>3</sup>	0.55
PROC15	TRA Workers 3.0		Dermal: long-term, systemic	0.03 mg/kg bw/d	0.01
PROC15	TRA Workers 3.0		Chronic dermal local exposure	0.01 mg/cm2	< 0.01
PROC15	TRA Workers 3.0		Dermal: acute, local	0.01 mg/cm2	< 0.01
PROC19, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC19	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC19	TRA Workers 3.0		Dermal: long-term, systemic	1.41 mg/kg bw/d	0.52
PROC19	TRA Workers 3.0		Chronic dermal local exposure	0.05 mg/cm2	0.03
PROC19	TRA Workers 3.0		Dermal: acute, local	0.05 mg/cm2	0.03
PROC3, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.26 mg/m <sup>3</sup>	0.42
PROC3	TRA Workers 3.0		Inhalation: short-term, systemic	5.05 mg/m <sup>3</sup>	0.28
PROC3	TRA Workers 3.0		Dermal: long-term, systemic	0.41 mg/kg bw/day	0.15
PROC3	TRA Workers 3.0		Chronic dermal local exposure	0.12 mg/cm2	0.08
PROC3	TRA Workers 3.0		Dermal: acute, local	0.12 mg/cm2	0.08
PROC5, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m <sup>3</sup>	0.49
PROC5	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m <sup>3</sup>	0.33
PROC5	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/kg bw/day	0.31

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PROC5	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC2, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC2	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC2	TRA Workers 3.0		Dermal: long-term, systemic	0.14 mg/kg bw/day	0.05
PROC2	TRA Workers 3.0		Chronic dermal local exposure	0.02 mg/cm <sup>2</sup>	0.01
PROC2	TRA Workers 3.0		Dermal: acute, local	0.02 mg/cm <sup>2</sup>	0.01
PROC4, PROC8a, PROC9, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 0.70 mg/m <sup>3</sup>	<= 0.23
PROC4, PROC8a, PROC9	TRA Workers 3.0		Inhalation: short-term, systemic	<= 2.81 mg/m <sup>3</sup>	<= 0.16
PROC4, PROC8a, PROC9	TRA Workers 3.0		Dermal: long-term, systemic	<= 1.37 mg/kg bw/day	<= 0.51
PROC4, PROC8a, PROC9	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC4, PROC8a, PROC9	TRA Workers 3.0		Dermal: acute, local	<= 0.1 mg/cm <sup>2</sup>	<= 0.06
PROC8b, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.25 mg/m <sup>3</sup>	0.08
PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	0.98 mg/m <sup>3</sup>	0.06
PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	1.37 mg/kg bw/day	0.51
PROC8b	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC8b	TRA Workers 3.0		Dermal: acute, local	0.1 mg/cm <sup>2</sup>	0.06
PROC14, PROC15, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.45 mg/m <sup>3</sup>	0.82
PROC14, PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/m <sup>3</sup>	0.55
PROC14, PROC15	TRA Workers 3.0		Dermal: long-term, systemic	<= 0.34 mg/kg bw/d	<= 0.13
PROC14, PROC15	TRA Workers 3.0		Chronic dermal local exposure	<= 0.05 mg/cm <sup>2</sup>	<= 0.03
PROC14, PROC15	TRA Workers 3.0		Dermal: acute, local	<= 0.05 mg/cm <sup>2</sup>	<= 0.03
PROC19, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC19	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC19	TRA Workers 3.0		Dermal: long-term, systemic	1.41 mg/kg bw/d	0.52
PROC19	TRA Workers 3.0		Chronic dermal local exposure	0.05 mg/cm <sup>2</sup>	0.03
PROC19	TRA Workers 3.0		Dermal: acute, local	0.05 mg/cm <sup>2</sup>	0.03

Further details on SpERCs, scaling, releases and control technologies are provided in IFRA Guidance "REACH Exposure Scenarios for Fragrance Substances"

For complete exposure estimation, the values for different routes of exposure and activities may have to be summed up.

assumes operating temperature: <= 40 °C

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## **4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario**

EUSES = EUSES version 2.1.1

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## ES 13: (AISE) Formulation of Detergents/Maintenance Products: High Viscosity Liquids (medium scale) Formulation of liquid Detergents/Maintenance Products: High Viscosity (large scale)

### 1. Scenario description

Main User Groups	: <b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites
Chemical product category	: <b>PC28:</b> Perfumes, fragrances <b>PC31:</b> Polishes and wax blends <b>PC35:</b> Washing and cleaning products (including solvent based products)
Process categories	: <b>PROC1:</b> Use in closed process, no likelihood of exposure <b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure <b>PROC3:</b> Use in closed batch process (synthesis or formulation) <b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises <b>PROC5:</b> Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) <b>PROC8a:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities <b>PROC8b:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities <b>PROC9:</b> Transfer of substance or preparation into small containers (dedicated filling line, including weighing) <b>PROC14:</b> Production of preparations or articles by tableting, compression, extrusion, pelletisation <b>PROC15:</b> Use as laboratory reagent <b>PROC19:</b> Hand-mixing with intimate contact and only PPE available
Environmental Release Categories	: <b>ERC2:</b> Formulation of preparations
Further information	: Cosmetics Europe / COLIPA

### 2.1 Contributing scenario controlling environmental exposure for: ERC2

#### Product characteristics

Viscosity, dynamic : 7.28 mPa.s (at 20 °C)

Annual amount per site (Msafe) : 812.9 t

Remarks : Msafe is the maximum amount of substance or product which may be used safely under the conditions defined in the environmental part of the exposure scenario.

#### Frequency and duration of use

Continuous exposure : 250 days/year

#### Environment factors not influenced by risk management

Flow rate of receiving surface water : 18,000 m<sup>3</sup>/d



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## Other given operational conditions affecting environmental exposure

Emission or Release Factor: Air : 0.0 %  
Emission or Release Factor: Water : 0.1 %  
Emission or Release Factor: Soil : 0.0 %

## Technical conditions and measures / Organizational measures

Water : All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.

## Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant : Municipal sewage treatment plant  
Flow rate of sewage treatment plant effluent : 2,000 m3/d  
Effectiveness (of a measure) : 87.7 %  
Sludge Treatment : Can be applied on agricultural soil, when in compliance with local regulations.

## Conditions and measures related to external treatment of waste for disposal

Disposal methods : Dispose of as hazardous waste in compliance with local and national regulations.

---

## 2.2 Contributing scenario controlling worker exposure for: PROC1, Liquid mixture

---

Activity : Product delivery/storage - product storage - indoor, Loading of application equipment - batch, indoor (liquid products)

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

---

## 2.3 Contributing scenario controlling worker exposure for: PROC2, PROC3, Liquid mixture

---

Activity : Process sampling

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

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### 2.4 Contributing scenario controlling worker exposure for: PROC5, PROC8b, Liquid mixture

Activity : Process sampling

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Liquid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

#### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

#### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness (of a measure): 90 %)

### 2.5 Contributing scenario controlling worker exposure for: PROC15, Liquid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Liquid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

#### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

### 2.6 Contributing scenario controlling worker exposure for: PROC2, Liquid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Liquid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### 2.7 Contributing scenario controlling worker exposure for: PROC4, PROC8a, PROC8b, PROC9, Liquid mixture

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### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.8 Contributing scenario controlling worker exposure for: PROC15, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## 2.9 Contributing scenario controlling worker exposure for: PROC19, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)  
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
(Effectiveness (of a measure): 90 %)

## 2.10 Contributing scenario controlling worker exposure for: PROC3, Solid mixture

Activity : Process sampling

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Solid mixture

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### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.11 Contributing scenario controlling worker exposure for: PROC5, Solid mixture

Activity : Process sampling

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness (of a measure): 90 %)

## 2.12 Contributing scenario controlling worker exposure for: PROC2, Solid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## 2.13 Contributing scenario controlling worker exposure for: PROC4, PROC8a, PROC9, Solid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

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### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

---

## 2.14 Contributing scenario controlling worker exposure for: PROC8b, Solid mixture

---

Activity : Process sampling

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

---

## 2.15 Contributing scenario controlling worker exposure for: PROC14, PROC15, Solid mixture

---

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

---

## 2.16 Contributing scenario controlling worker exposure for: PROC19, Solid mixture

---

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

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### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

(Effectiveness (of a measure): 90 %)

### 3. Exposure estimation and reference to its source

#### Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure (PEC)	RCR
ERC2	EUSES		Fresh water		0.02 mg/l	0.88
			Fresh water sediment		0.20 mg/kg dry weight	0.88
			Marine water		0.002 mg/l	0.88
			Marine sediment		0.02 mg/kg dry weight	0.88
			Sewage treatment plant		0.2 mg/l	0.02
			Soil		0.03 mg/kg dry weight	0.85

#### Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PROC1, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.04 mg/m <sup>3</sup>	0.01
PROC1	TRA Workers 3.0		Inhalation: short-term, systemic	0.17 mg/m <sup>3</sup>	< 0.01
PROC1	TRA Workers 3.0		Dermal: long-term, systemic	0.02 mg/kg bw/d	< 0.01
PROC1	TRA Workers 3.0		Chronic dermal local exposure	0.006 mg/cm <sup>2</sup>	< 0.01
PROC1	TRA Workers 3.0		Dermal: acute, local	0.006 mg/cm <sup>2</sup>	< 0.01
PROC2, PROC3, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 1.26 mg/m <sup>3</sup>	<= 0.42
PROC2, PROC3	TRA Workers 3.0		Inhalation: short-term, systemic	5.05 mg/m <sup>3</sup>	<= 0.28
PROC2, PROC3	TRA Workers 3.0		Dermal: long-term, systemic	<= 0.82 mg/kg bw/day	<= 0.30
PROC2, PROC3	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC2, PROC3	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5, PROC8b, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m <sup>3</sup>	0.49
PROC5, PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m <sup>3</sup>	0.33
PROC5, PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/kg bw/day	0.31
PROC5, PROC8b	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5, PROC8b	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC15, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.10 mg/m <sup>3</sup>	0.70
PROC15	TRA Workers		Inhalation: short-term,	8.41 mg/cm <sup>2</sup>	0.47

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	3.0		systemic		
PROC15	TRA Workers 3.0		Dermal: long-term, systemic	0.20 mg/kg bw/day	0.08
PROC15	TRA Workers 3.0		Chronic dermal local exposure	0.06 mg/cm2	0.04
PROC15	TRA Workers 3.0		Dermal: acute, local	0.06 mg/cm2	0.04
PROC2, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC2	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC2	TRA Workers 3.0		Dermal: long-term, systemic	0.14 mg/kg bw/day	0.05
PROC2	TRA Workers 3.0		Chronic dermal local exposure	0.02 mg/cm2	0.01
PROC2	TRA Workers 3.0		Dermal: acute, local	0.02 mg/cm2	0.01
PROC4, PROC8a, PROC8b, PROC9, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 0.70 mg/m <sup>3</sup>	<= 0.23
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Inhalation: short-term, systemic	<= 2.81 mg/m <sup>3</sup>	<= 0.16
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Dermal: long-term, systemic	<= 1.37 mg/kg bw/day	<= 0.51
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm2	0.06
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Dermal: acute, local	<= 0.1 mg/cm2	<= 0.06
PROC15, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.45 mg/m <sup>3</sup>	0.82
PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/m <sup>3</sup>	0.55
PROC15	TRA Workers 3.0		Dermal: long-term, systemic	0.03 mg/kg bw/d	0.01
PROC15	TRA Workers 3.0		Chronic dermal local exposure	0.01 mg/cm2	< 0.01
PROC15	TRA Workers 3.0		Dermal: acute, local	0.01 mg/cm2	< 0.01
PROC19, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC19	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC19	TRA Workers 3.0		Dermal: long-term, systemic	1.41 mg/kg bw/d	0.52
PROC19	TRA Workers 3.0		Chronic dermal local exposure	0.05 mg/cm2	0.03
PROC19	TRA Workers 3.0		Dermal: acute, local	0.05 mg/cm2	0.03
PROC3, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.26 mg/m <sup>3</sup>	0.42
PROC3	TRA Workers 3.0		Inhalation: short-term, systemic	5.05 mg/m <sup>3</sup>	0.28
PROC3	TRA Workers 3.0		Dermal: long-term, systemic	0.41 mg/kg bw/day	0.15
PROC3	TRA Workers 3.0		Chronic dermal local exposure	0.12 mg/cm2	0.08
PROC3	TRA Workers 3.0		Dermal: acute, local	0.12 mg/cm2	0.08
PROC5, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m <sup>3</sup>	0.49
PROC5	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m <sup>3</sup>	0.33
PROC5	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/kg bw/day	0.31

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PROC5	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC2, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC2	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC2	TRA Workers 3.0		Dermal: long-term, systemic	0.14 mg/kg bw/day	0.05
PROC2	TRA Workers 3.0		Chronic dermal local exposure	0.02 mg/cm <sup>2</sup>	0.01
PROC2	TRA Workers 3.0		Dermal: acute, local	0.02 mg/cm <sup>2</sup>	0.01
PROC4, PROC8a, PROC9, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 0.70 mg/m <sup>3</sup>	<= 0.23
PROC4, PROC8a, PROC9	TRA Workers 3.0		Inhalation: short-term, systemic	<= 2.81 mg/m <sup>3</sup>	<= 0.16
PROC4, PROC8a, PROC9	TRA Workers 3.0		Dermal: long-term, systemic	<= 1.37 mg/kg bw/day	<= 0.51
PROC4, PROC8a, PROC9	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC4, PROC8a, PROC9	TRA Workers 3.0		Dermal: acute, local	<= 0.1 mg/cm <sup>2</sup>	<= 0.06
PROC8b, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.25 mg/m <sup>3</sup>	0.08
PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	0.98 mg/m <sup>3</sup>	0.06
PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	1.37 mg/kg bw/day	0.51
PROC8b	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC8b	TRA Workers 3.0		Dermal: acute, local	0.1 mg/cm <sup>2</sup>	0.06
PROC14, PROC15, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.45 mg/m <sup>3</sup>	0.82
PROC14, PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/m <sup>3</sup>	0.55
PROC14, PROC15	TRA Workers 3.0		Dermal: long-term, systemic	<= 0.34 mg/kg bw/d	<= 0.13
PROC14, PROC15	TRA Workers 3.0		Chronic dermal local exposure	<= 0.05 mg/cm <sup>2</sup>	<= 0.03
PROC14, PROC15	TRA Workers 3.0		Dermal: acute, local	<= 0.05 mg/cm <sup>2</sup>	<= 0.03
PROC19, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC19	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC19	TRA Workers 3.0		Dermal: long-term, systemic	1.41 mg/kg bw/d	0.52
PROC19	TRA Workers 3.0		Chronic dermal local exposure	0.05 mg/cm <sup>2</sup>	0.03
PROC19	TRA Workers 3.0		Dermal: acute, local	0.05 mg/cm <sup>2</sup>	0.03

Further details on SpERCs, scaling, releases and control technologies are provided in IFRA Guidance "REACH Exposure Scenarios for Fragrance Substances"

For complete exposure estimation, the values for different routes of exposure and activities may have to be summed up.

assumes operating temperature: <= 40 °C



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## **4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario**

EUSES = EUSES version 2.1.1

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## ES 14: (AISE) Formulation of Detergents/Maintenance Products: High Viscosity Liquids (medium scale)

### 1. Scenario description

Main User Groups	: <b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites
Chemical product category	: <b>PC28:</b> Perfumes, fragrances <b>PC31:</b> Polishes and wax blends <b>PC35:</b> Washing and cleaning products (including solvent based products)
Process categories	: <b>PROC1:</b> Use in closed process, no likelihood of exposure <b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure <b>PROC3:</b> Use in closed batch process (synthesis or formulation) <b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises <b>PROC5:</b> Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) <b>PROC8a:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities <b>PROC8b:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities <b>PROC9:</b> Transfer of substance or preparation into small containers (dedicated filling line, including weighing) <b>PROC14:</b> Production of preparations or articles by tableting, compression, extrusion, pelletisation <b>PROC15:</b> Use as laboratory reagent <b>PROC19:</b> Hand-mixing with intimate contact and only PPE available
Environmental Release Categories	: <b>ERC2:</b> Formulation of preparations
Further information	: Cosmetics Europe / COLIPA

### 2.1 Contributing scenario controlling environmental exposure for: ERC2

#### Product characteristics

Viscosity, dynamic	: 7.28 mPa.s (at 20 °C)
Annual amount per site (Msafe)	: 406.8 t
Remarks	: Msafe is the maximum amount of substance or product which may be used safely under the conditions defined in the environmental part of the exposure scenario.

#### Frequency and duration of use

Continuous exposure	: 250 days/year
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#### Environment factors not influenced by risk management

Flow rate of receiving surface water	: 18,000 m <sup>3</sup> /d
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## Other given operational conditions affecting environmental exposure

Emission or Release Factor: Air : 0.0 %  
Emission or Release Factor: Water : 0.2 %  
Emission or Release Factor: Soil : 0.0 %

## Technical conditions and measures / Organizational measures

Water : All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.

## Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant : Municipal sewage treatment plant  
Flow rate of sewage treatment plant effluent : 2,000 m<sup>3</sup>/d  
Effectiveness (of a measure) : 87.7 %  
Sludge Treatment : Can be applied on agricultural soil, when in compliance with local regulations.

## Conditions and measures related to external treatment of waste for disposal

Disposal methods : Dispose of as hazardous waste in compliance with local and national regulations.

---

## 2.2 Contributing scenario controlling worker exposure for: PROC1, Liquid mixture

---

Activity : Product delivery/storage - product storage - indoor, Loading of application equipment - batch, indoor (liquid products)

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

---

## 2.3 Contributing scenario controlling worker exposure for: PROC2, PROC3, Liquid mixture

---

Activity : Process sampling

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

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### 2.4 Contributing scenario controlling worker exposure for: PROC5, PROC8b, Liquid mixture

Activity : Process sampling

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Liquid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

#### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

#### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness (of a measure): 90 %)

### 2.5 Contributing scenario controlling worker exposure for: PROC15, Liquid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Liquid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

#### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

### 2.6 Contributing scenario controlling worker exposure for: PROC2, Liquid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Liquid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### 2.7 Contributing scenario controlling worker exposure for: PROC4, PROC8a, PROC8b, PROC9, Liquid mixture

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### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.8 Contributing scenario controlling worker exposure for: PROC15, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## 2.9 Contributing scenario controlling worker exposure for: PROC19, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)  
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
(Effectiveness (of a measure): 90 %)

## 2.10 Contributing scenario controlling worker exposure for: PROC3, Solid mixture

Activity : Process sampling

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Solid mixture

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## Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

### 2.11 Contributing scenario controlling worker exposure for: PROC5, Solid mixture

Activity : Process sampling

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Solid mixture

## Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)  
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
(Effectiveness (of a measure): 90 %)

### 2.12 Contributing scenario controlling worker exposure for: PROC2, Solid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Solid mixture

## Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### 2.13 Contributing scenario controlling worker exposure for: PROC4, PROC8a, PROC9, Solid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Solid mixture

## Frequency and duration of use

Frequency of use : <= 8 hours/day

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### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

---

## 2.14 Contributing scenario controlling worker exposure for: PROC8b, Solid mixture

---

Activity : Process sampling

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

---

## 2.15 Contributing scenario controlling worker exposure for: PROC14, PROC15, Solid mixture

---

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

---

## 2.16 Contributing scenario controlling worker exposure for: PROC19, Solid mixture

---

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

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### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

(Effectiveness (of a measure): 90 %)

### 3. Exposure estimation and reference to its source

#### Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure (PEC)	RCR
ERC2	EUSES		Fresh water		0.02 mg/l	0.88
			Fresh water sediment		0.20 mg/kg dry weight	0.88
			Marine water		0.002 mg/l	0.88
			Marine sediment		0.02 mg/kg dry weight	0.88
			Sewage treatment plant		0.2 mg/l	0.02
			Soil		0.03 mg/kg dry weight	0.85

#### Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PROC1, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.04 mg/m <sup>3</sup>	0.01
PROC1	TRA Workers 3.0		Inhalation: short-term, systemic	0.17 mg/m <sup>3</sup>	< 0.01
PROC1	TRA Workers 3.0		Dermal: long-term, systemic	0.02 mg/kg bw/d	< 0.01
PROC1	TRA Workers 3.0		Chronic dermal local exposure	0.006 mg/cm <sup>2</sup>	< 0.01
PROC1	TRA Workers 3.0		Dermal: acute, local	0.006 mg/cm <sup>2</sup>	< 0.01
PROC2, PROC3, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 1.26 mg/m <sup>3</sup>	<= 0.42
PROC2, PROC3	TRA Workers 3.0		Inhalation: short-term, systemic	5.05 mg/m <sup>3</sup>	<= 0.28
PROC2, PROC3	TRA Workers 3.0		Dermal: long-term, systemic	<= 0.82 mg/kg bw/day	<= 0.30
PROC2, PROC3	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC2, PROC3	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5, PROC8b, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m <sup>3</sup>	0.49
PROC5, PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m <sup>3</sup>	0.33
PROC5, PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/kg bw/day	0.31
PROC5, PROC8b	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5, PROC8b	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC15, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.10 mg/m <sup>3</sup>	0.70
PROC15	TRA Workers		Inhalation: short-term,	8.41 mg/cm <sup>2</sup>	0.47



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	3.0		systemic		
PROC15	TRA Workers 3.0		Dermal: long-term, systemic	0.20 mg/kg bw/day	0.08
PROC15	TRA Workers 3.0		Chronic dermal local exposure	0.06 mg/cm2	0.04
PROC15	TRA Workers 3.0		Dermal: acute, local	0.06 mg/cm2	0.04
PROC2, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC2	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC2	TRA Workers 3.0		Dermal: long-term, systemic	0.14 mg/kg bw/day	0.05
PROC2	TRA Workers 3.0		Chronic dermal local exposure	0.02 mg/cm2	0.01
PROC2	TRA Workers 3.0		Dermal: acute, local	0.02 mg/cm2	0.01
PROC4, PROC8a, PROC8b, PROC9, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 0.70 mg/m <sup>3</sup>	<= 0.23
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Inhalation: short-term, systemic	<= 2.81 mg/m <sup>3</sup>	<= 0.16
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Dermal: long-term, systemic	<= 1.37 mg/kg bw/day	<= 0.51
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm2	0.06
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Dermal: acute, local	<= 0.1 mg/cm2	<= 0.06
PROC15, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.45 mg/m <sup>3</sup>	0.82
PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/m <sup>3</sup>	0.55
PROC15	TRA Workers 3.0		Dermal: long-term, systemic	0.03 mg/kg bw/d	0.01
PROC15	TRA Workers 3.0		Chronic dermal local exposure	0.01 mg/cm2	< 0.01
PROC15	TRA Workers 3.0		Dermal: acute, local	0.01 mg/cm2	< 0.01
PROC19, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC19	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC19	TRA Workers 3.0		Dermal: long-term, systemic	1.41 mg/kg bw/d	0.52
PROC19	TRA Workers 3.0		Chronic dermal local exposure	0.05 mg/cm2	0.03
PROC19	TRA Workers 3.0		Dermal: acute, local	0.05 mg/cm2	0.03
PROC3, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.26 mg/m <sup>3</sup>	0.42
PROC3	TRA Workers 3.0		Inhalation: short-term, systemic	5.05 mg/m <sup>3</sup>	0.28
PROC3	TRA Workers 3.0		Dermal: long-term, systemic	0.41 mg/kg bw/day	0.15
PROC3	TRA Workers 3.0		Chronic dermal local exposure	0.12 mg/cm2	0.08
PROC3	TRA Workers 3.0		Dermal: acute, local	0.12 mg/cm2	0.08
PROC5, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m <sup>3</sup>	0.49
PROC5	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m <sup>3</sup>	0.33
PROC5	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/kg bw/day	0.31

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PROC5	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC2, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC2	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC2	TRA Workers 3.0		Dermal: long-term, systemic	0.14 mg/kg bw/day	0.05
PROC2	TRA Workers 3.0		Chronic dermal local exposure	0.02 mg/cm <sup>2</sup>	0.01
PROC2	TRA Workers 3.0		Dermal: acute, local	0.02 mg/cm <sup>2</sup>	0.01
PROC4, PROC8a, PROC9, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 0.70 mg/m <sup>3</sup>	<= 0.23
PROC4, PROC8a, PROC9	TRA Workers 3.0		Inhalation: short-term, systemic	<= 2.81 mg/m <sup>3</sup>	<= 0.16
PROC4, PROC8a, PROC9	TRA Workers 3.0		Dermal: long-term, systemic	<= 1.37 mg/kg bw/day	<= 0.51
PROC4, PROC8a, PROC9	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC4, PROC8a, PROC9	TRA Workers 3.0		Dermal: acute, local	<= 0.1 mg/cm <sup>2</sup>	<= 0.06
PROC8b, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.25 mg/m <sup>3</sup>	0.08
PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	0.98 mg/m <sup>3</sup>	0.06
PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	1.37 mg/kg bw/day	0.51
PROC8b	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC8b	TRA Workers 3.0		Dermal: acute, local	0.1 mg/cm <sup>2</sup>	0.06
PROC14, PROC15, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.45 mg/m <sup>3</sup>	0.82
PROC14, PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/m <sup>3</sup>	0.55
PROC14, PROC15	TRA Workers 3.0		Dermal: long-term, systemic	<= 0.34 mg/kg bw/d	<= 0.13
PROC14, PROC15	TRA Workers 3.0		Chronic dermal local exposure	<= 0.05 mg/cm <sup>2</sup>	<= 0.03
PROC14, PROC15	TRA Workers 3.0		Dermal: acute, local	<= 0.05 mg/cm <sup>2</sup>	<= 0.03
PROC19, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC19	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC19	TRA Workers 3.0		Dermal: long-term, systemic	1.41 mg/kg bw/d	0.52
PROC19	TRA Workers 3.0		Chronic dermal local exposure	0.05 mg/cm <sup>2</sup>	0.03
PROC19	TRA Workers 3.0		Dermal: acute, local	0.05 mg/cm <sup>2</sup>	0.03

Further details on SpERCs, scaling, releases and control technologies are provided in IFRA Guidance "REACH Exposure Scenarios for Fragrance Substances"

For complete exposure estimation, the values for different routes of exposure and activities may have to be summed up.

assumes operating temperature: <= 40 °C

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## **4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario**

EUSES = EUSES version 2.1.1

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## ES 15: (AISE) Formulation of Detergents/Maintenance Products: High Viscosity Liquids (small scale)

### 1. Scenario description

Main User Groups	: <b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites
Chemical product category	: <b>PC28:</b> Perfumes, fragrances <b>PC31:</b> Polishes and wax blends <b>PC35:</b> Washing and cleaning products (including solvent based products)
Process categories	: <b>PROC1:</b> Use in closed process, no likelihood of exposure <b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure <b>PROC3:</b> Use in closed batch process (synthesis or formulation) <b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises <b>PROC5:</b> Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) <b>PROC8a:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities <b>PROC8b:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities <b>PROC9:</b> Transfer of substance or preparation into small containers (dedicated filling line, including weighing) <b>PROC14:</b> Production of preparations or articles by tableting, compression, extrusion, pelletisation <b>PROC15:</b> Use as laboratory reagent <b>PROC19:</b> Hand-mixing with intimate contact and only PPE available
Environmental Release Categories	: <b>ERC2:</b> Formulation of preparations
Further information	: Cosmetics Europe / COLIPA

### 2.1 Contributing scenario controlling environmental exposure for: ERC2

#### Product characteristics

Viscosity, dynamic	: 7.28 mPa.s (at 20 °C)
Annual amount per site (Msafe)	: 203.3 t
Remarks	: Msafe is the maximum amount of substance or product which may be used safely under the conditions defined in the environmental part of the exposure scenario.

#### Frequency and duration of use

Continuous exposure	: 250 days/year
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#### Environment factors not influenced by risk management

Flow rate of receiving surface water	: 18,000 m <sup>3</sup> /d
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## Other given operational conditions affecting environmental exposure

Emission or Release Factor: Air : 0.0 %  
Emission or Release Factor: Water : 0.4 %  
Emission or Release Factor: Soil : 0.0 %

## Technical conditions and measures / Organizational measures

Water : All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.

## Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant : Municipal sewage treatment plant  
Flow rate of sewage treatment plant effluent : 2,000 m<sup>3</sup>/d  
Effectiveness (of a measure) : 87.7 %  
Sludge Treatment : Can be applied on agricultural soil, when in compliance with local regulations.

## Conditions and measures related to external treatment of waste for disposal

Disposal methods : Dispose of as hazardous waste in compliance with local and national regulations.

---

## 2.2 Contributing scenario controlling worker exposure for: PROC1, Liquid mixture

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Activity : Product delivery/storage - product storage - indoor, Loading of application equipment - batch, indoor (liquid products)

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

---

## 2.3 Contributing scenario controlling worker exposure for: PROC2, PROC3, Liquid mixture

---

Activity : Process sampling

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

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### 2.4 Contributing scenario controlling worker exposure for: PROC5, PROC8b, Liquid mixture

Activity : Process sampling

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Liquid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

#### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

#### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness (of a measure): 90 %)

### 2.5 Contributing scenario controlling worker exposure for: PROC15, Liquid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Liquid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

#### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

### 2.6 Contributing scenario controlling worker exposure for: PROC2, Liquid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Liquid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### 2.7 Contributing scenario controlling worker exposure for: PROC4, PROC8a, PROC8b, PROC9, Liquid mixture

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### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.8 Contributing scenario controlling worker exposure for: PROC15, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## 2.9 Contributing scenario controlling worker exposure for: PROC19, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)  
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
(Effectiveness (of a measure): 90 %)

## 2.10 Contributing scenario controlling worker exposure for: PROC3, Solid mixture

Activity : Process sampling

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Solid mixture

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## Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

### 2.11 Contributing scenario controlling worker exposure for: PROC5, Solid mixture

Activity : Process sampling

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Solid mixture

## Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)  
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
(Effectiveness (of a measure): 90 %)

### 2.12 Contributing scenario controlling worker exposure for: PROC2, Solid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Solid mixture

## Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### 2.13 Contributing scenario controlling worker exposure for: PROC4, PROC8a, PROC9, Solid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Solid mixture

## Frequency and duration of use

Frequency of use : <= 8 hours/day



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### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

---

## 2.14 Contributing scenario controlling worker exposure for: PROC8b, Solid mixture

---

Activity : Process sampling

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

---

## 2.15 Contributing scenario controlling worker exposure for: PROC14, PROC15, Solid mixture

---

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

---

## 2.16 Contributing scenario controlling worker exposure for: PROC19, Solid mixture

---

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

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### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

(Effectiveness (of a measure): 90 %)

### 3. Exposure estimation and reference to its source

#### Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure (PEC)	RCR
ERC2	EUSES		Fresh water		0.02 mg/l	0.88
			Fresh water sediment		0.20 mg/kg dry weight	0.88
			Marine water		0.002 mg/l	0.88
			Marine sediment		0.02 mg/kg dry weight	0.88
			Sewage treatment plant		0.2 mg/l	0.02
			Soil		0.03 mg/kg dry weight	0.85

#### Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PROC1, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.04 mg/m <sup>3</sup>	0.01
PROC1	TRA Workers 3.0		Inhalation: short-term, systemic	0.17 mg/m <sup>3</sup>	< 0.01
PROC1	TRA Workers 3.0		Dermal: long-term, systemic	0.02 mg/kg bw/d	< 0.01
PROC1	TRA Workers 3.0		Chronic dermal local exposure	0.006 mg/cm <sup>2</sup>	< 0.01
PROC1	TRA Workers 3.0		Dermal: acute, local	0.006 mg/cm <sup>2</sup>	< 0.01
PROC2, PROC3, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 1.26 mg/m <sup>3</sup>	<= 0.42
PROC2, PROC3	TRA Workers 3.0		Inhalation: short-term, systemic	5.05 mg/m <sup>3</sup>	<= 0.28
PROC2, PROC3	TRA Workers 3.0		Dermal: long-term, systemic	<= 0.82 mg/kg bw/day	<= 0.30
PROC2, PROC3	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC2, PROC3	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5, PROC8b, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m <sup>3</sup>	0.49
PROC5, PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m <sup>3</sup>	0.33
PROC5, PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/kg bw/day	0.31
PROC5, PROC8b	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5, PROC8b	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC15, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.10 mg/m <sup>3</sup>	0.70
PROC15	TRA Workers		Inhalation: short-term,	8.41 mg/cm <sup>2</sup>	0.47

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PROC15	TRA Workers 3.0		Dermal: long-term, systemic	0.20 mg/kg bw/day	0.08
PROC15	TRA Workers 3.0		Chronic dermal local exposure	0.06 mg/cm2	0.04
PROC15	TRA Workers 3.0		Dermal: acute, local	0.06 mg/cm2	0.04
PROC2, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC2	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC2	TRA Workers 3.0		Dermal: long-term, systemic	0.14 mg/kg bw/day	0.05
PROC2	TRA Workers 3.0		Chronic dermal local exposure	0.02 mg/cm2	0.01
PROC2	TRA Workers 3.0		Dermal: acute, local	0.02 mg/cm2	0.01
PROC4, PROC8a, PROC8b, PROC9, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 0.70 mg/m <sup>3</sup>	<= 0.23
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Inhalation: short-term, systemic	<= 2.81 mg/m <sup>3</sup>	<= 0.16
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Dermal: long-term, systemic	<= 1.37 mg/kg bw/day	<= 0.51
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm2	0.06
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Dermal: acute, local	<= 0.1 mg/cm2	<= 0.06
PROC15, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.45 mg/m <sup>3</sup>	0.82
PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/m <sup>3</sup>	0.55
PROC15	TRA Workers 3.0		Dermal: long-term, systemic	0.03 mg/kg bw/d	0.01
PROC15	TRA Workers 3.0		Chronic dermal local exposure	0.01 mg/cm2	< 0.01
PROC15	TRA Workers 3.0		Dermal: acute, local	0.01 mg/cm2	< 0.01
PROC19, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC19	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC19	TRA Workers 3.0		Dermal: long-term, systemic	1.41 mg/kg bw/d	0.52
PROC19	TRA Workers 3.0		Chronic dermal local exposure	0.05 mg/cm2	0.03
PROC19	TRA Workers 3.0		Dermal: acute, local	0.05 mg/cm2	0.03
PROC3, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.26 mg/m <sup>3</sup>	0.42
PROC3	TRA Workers 3.0		Inhalation: short-term, systemic	5.05 mg/m <sup>3</sup>	0.28
PROC3	TRA Workers 3.0		Dermal: long-term, systemic	0.41 mg/kg bw/day	0.15
PROC3	TRA Workers 3.0		Chronic dermal local exposure	0.12 mg/cm2	0.08
PROC3	TRA Workers 3.0		Dermal: acute, local	0.12 mg/cm2	0.08
PROC5, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m <sup>3</sup>	0.49
PROC5	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m <sup>3</sup>	0.33
PROC5	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/kg bw/day	0.31

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PROC5	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC2, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC2	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC2	TRA Workers 3.0		Dermal: long-term, systemic	0.14 mg/kg bw/day	0.05
PROC2	TRA Workers 3.0		Chronic dermal local exposure	0.02 mg/cm <sup>2</sup>	0.01
PROC2	TRA Workers 3.0		Dermal: acute, local	0.02 mg/cm <sup>2</sup>	0.01
PROC4, PROC8a, PROC9, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 0.70 mg/m <sup>3</sup>	<= 0.23
PROC4, PROC8a, PROC9	TRA Workers 3.0		Inhalation: short-term, systemic	<= 2.81 mg/m <sup>3</sup>	<= 0.16
PROC4, PROC8a, PROC9	TRA Workers 3.0		Dermal: long-term, systemic	<= 1.37 mg/kg bw/day	<= 0.51
PROC4, PROC8a, PROC9	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC4, PROC8a, PROC9	TRA Workers 3.0		Dermal: acute, local	<= 0.1 mg/cm <sup>2</sup>	<= 0.06
PROC8b, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.25 mg/m <sup>3</sup>	0.08
PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	0.98 mg/m <sup>3</sup>	0.06
PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	1.37 mg/kg bw/day	0.51
PROC8b	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC8b	TRA Workers 3.0		Dermal: acute, local	0.1 mg/cm <sup>2</sup>	0.06
PROC14, PROC15, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.45 mg/m <sup>3</sup>	0.82
PROC14, PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/m <sup>3</sup>	0.55
PROC14, PROC15	TRA Workers 3.0		Dermal: long-term, systemic	<= 0.34 mg/kg bw/d	<= 0.13
PROC14, PROC15	TRA Workers 3.0		Chronic dermal local exposure	<= 0.05 mg/cm <sup>2</sup>	<= 0.03
PROC14, PROC15	TRA Workers 3.0		Dermal: acute, local	<= 0.05 mg/cm <sup>2</sup>	<= 0.03
PROC19, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC19	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC19	TRA Workers 3.0		Dermal: long-term, systemic	1.41 mg/kg bw/d	0.52
PROC19	TRA Workers 3.0		Chronic dermal local exposure	0.05 mg/cm <sup>2</sup>	0.03
PROC19	TRA Workers 3.0		Dermal: acute, local	0.05 mg/cm <sup>2</sup>	0.03

Further details on SpERCs, scaling, releases and control technologies are provided in IFRA Guidance "REACH Exposure Scenarios for Fragrance Substances"

For complete exposure estimation, the values for different routes of exposure and activities may have to be summed up.

assumes operating temperature: <= 40 °C

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## **4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario**

EUSES = EUSES version 2.1.1

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## **ES 16: (AISE) Formulation of Detergents/Maintenance Products: Granular Compact (large scale)**

### **1. Scenario description**

Main User Groups	: <b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites
Chemical product category	: <b>PC28:</b> Perfumes, fragrances <b>PC31:</b> Polishes and wax blends <b>PC35:</b> Washing and cleaning products (including solvent based products)
Process categories	: <b>PROC1:</b> Use in closed process, no likelihood of exposure <b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure <b>PROC3:</b> Use in closed batch process (synthesis or formulation) <b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises <b>PROC5:</b> Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) <b>PROC8a:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities <b>PROC8b:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities <b>PROC9:</b> Transfer of substance or preparation into small containers (dedicated filling line, including weighing) <b>PROC14:</b> Production of preparations or articles by tableting, compression, extrusion, pelletisation <b>PROC15:</b> Use as laboratory reagent <b>PROC19:</b> Hand-mixing with intimate contact and only PPE available
Environmental Release Categories	: <b>ERC2:</b> Formulation of preparations
Further information	: Cosmetics Europe / COLIPA

### **2.1 Contributing scenario controlling environmental exposure for: ERC2**

#### **Product characteristics**

Viscosity, dynamic	: 7.28 mPa.s (at 20 °C)
Annual amount per site (Msafe)	: 300 t
Remarks	: Msafe is the maximum amount of substance or product which may be used safely under the conditions defined in the environmental part of the exposure scenario.

#### **Frequency and duration of use**

Continuous exposure	: 250 days/year
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#### **Environment factors not influenced by risk management**

Flow rate of receiving surface water	: 18,000 m <sup>3</sup> /d
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## Other given operational conditions affecting environmental exposure

Emission or Release Factor: Air : 0.0 %  
Emission or Release Factor: Water : 0.01 %  
Emission or Release Factor: Soil : 0.0 %

## Technical conditions and measures / Organizational measures

Water : All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.

## Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant : Municipal sewage treatment plant  
Flow rate of sewage treatment plant effluent : 2,000 m3/d  
Effectiveness (of a measure) : 87.7 %  
Sludge Treatment : Can be applied on agricultural soil, when in compliance with local regulations.

## Conditions and measures related to external treatment of waste for disposal

Disposal methods : Dispose of as hazardous waste in compliance with local and national regulations.

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## 2.2 Contributing scenario controlling worker exposure for: PROC1, Liquid mixture

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Activity : Product delivery/storage - product storage - indoor, Loading of application equipment - batch, indoor (liquid products)

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

---

## 2.3 Contributing scenario controlling worker exposure for: PROC2, PROC3, Liquid mixture

---

Activity : Process sampling

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

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### 2.4 Contributing scenario controlling worker exposure for: PROC5, PROC8b, Liquid mixture

Activity : Process sampling

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Liquid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

#### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

#### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness (of a measure): 90 %)

### 2.5 Contributing scenario controlling worker exposure for: PROC15, Liquid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Liquid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

#### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

### 2.6 Contributing scenario controlling worker exposure for: PROC2, Liquid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Liquid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### 2.7 Contributing scenario controlling worker exposure for: PROC4, PROC8a, PROC8b, PROC9, Liquid mixture



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### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.8 Contributing scenario controlling worker exposure for: PROC15, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## 2.9 Contributing scenario controlling worker exposure for: PROC19, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)  
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
(Effectiveness (of a measure): 90 %)

## 2.10 Contributing scenario controlling worker exposure for: PROC3, Solid mixture

Activity : Process sampling

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Solid mixture

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### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.11 Contributing scenario controlling worker exposure for: PROC5, Solid mixture

Activity : Process sampling

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)  
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
(Effectiveness (of a measure): 90 %)

## 2.12 Contributing scenario controlling worker exposure for: PROC2, Solid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## 2.13 Contributing scenario controlling worker exposure for: PROC4, PROC8a, PROC9, Solid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

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## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

---

## 2.14 Contributing scenario controlling worker exposure for: PROC8b, Solid mixture

---

Activity : Process sampling

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

---

## 2.15 Contributing scenario controlling worker exposure for: PROC14, PROC15, Solid mixture

---

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

---

## 2.16 Contributing scenario controlling worker exposure for: PROC19, Solid mixture

---

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

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### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

(Effectiveness (of a measure): 90 %)

### 3. Exposure estimation and reference to its source

#### Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure (PEC)	RCR
ERC2	EUSES		Fresh water		0.0009 mg/l	0.04
			Fresh water sediment		0.009 mg/kg dry weight	0.04
			Marine water		0.00009 mg/l	0.04
			Marine sediment		0.0009 mg/kg dry weight	0.04
			Sewage treatment plant		0.007 mg/l	< 0.01
			Soil		0.001 mg/kg dry weight	0.03

#### Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PROC1, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.04 mg/m <sup>3</sup>	0.01
PROC1	TRA Workers 3.0		Inhalation: short-term, systemic	0.17 mg/m <sup>3</sup>	< 0.01
PROC1	TRA Workers 3.0		Dermal: long-term, systemic	0.02 mg/kg bw/d	< 0.01
PROC1	TRA Workers 3.0		Chronic dermal local exposure	0.006 mg/cm <sup>2</sup>	< 0.01
PROC1	TRA Workers 3.0		Dermal: acute, local	0.006 mg/cm <sup>2</sup>	< 0.01
PROC2, PROC3, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 1.26 mg/m <sup>3</sup>	<= 0.42
PROC2, PROC3	TRA Workers 3.0		Inhalation: short-term, systemic	5.05 mg/m <sup>3</sup>	<= 0.28
PROC2, PROC3	TRA Workers 3.0		Dermal: long-term, systemic	<= 0.82 mg/kg bw/day	<= 0.30
PROC2, PROC3	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC2, PROC3	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5, PROC8b, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m <sup>3</sup>	0.49
PROC5, PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m <sup>3</sup>	0.33
PROC5, PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/kg bw/day	0.31
PROC5, PROC8b	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5, PROC8b	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC15, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.10 mg/m <sup>3</sup>	0.70
PROC15	TRA Workers		Inhalation: short-term,	8.41 mg/cm <sup>2</sup>	0.47

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	3.0		systemic		
PROC15	TRA Workers 3.0		Dermal: long-term, systemic	0.20 mg/kg bw/day	0.08
PROC15	TRA Workers 3.0		Chronic dermal local exposure	0.06 mg/cm2	0.04
PROC15	TRA Workers 3.0		Dermal: acute, local	0.06 mg/cm2	0.04
PROC2, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC2	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC2	TRA Workers 3.0		Dermal: long-term, systemic	0.14 mg/kg bw/day	0.05
PROC2	TRA Workers 3.0		Chronic dermal local exposure	0.02 mg/cm2	0.01
PROC2	TRA Workers 3.0		Dermal: acute, local	0.02 mg/cm2	0.01
PROC4, PROC8a, PROC8b, PROC9, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 0.70 mg/m <sup>3</sup>	<= 0.23
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Inhalation: short-term, systemic	<= 2.81 mg/m <sup>3</sup>	<= 0.16
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Dermal: long-term, systemic	<= 1.37 mg/kg bw/day	<= 0.51
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm2	0.06
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Dermal: acute, local	<= 0.1 mg/cm2	<= 0.06
PROC15, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.45 mg/m <sup>3</sup>	0.82
PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/m <sup>3</sup>	0.55
PROC15	TRA Workers 3.0		Dermal: long-term, systemic	0.03 mg/kg bw/d	0.01
PROC15	TRA Workers 3.0		Chronic dermal local exposure	0.01 mg/cm2	< 0.01
PROC15	TRA Workers 3.0		Dermal: acute, local	0.01 mg/cm2	< 0.01
PROC19, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC19	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC19	TRA Workers 3.0		Dermal: long-term, systemic	1.41 mg/kg bw/d	0.52
PROC19	TRA Workers 3.0		Chronic dermal local exposure	0.05 mg/cm2	0.03
PROC19	TRA Workers 3.0		Dermal: acute, local	0.05 mg/cm2	0.03
PROC3, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.26 mg/m <sup>3</sup>	0.42
PROC3	TRA Workers 3.0		Inhalation: short-term, systemic	5.05 mg/m <sup>3</sup>	0.28
PROC3	TRA Workers 3.0		Dermal: long-term, systemic	0.41 mg/kg bw/day	0.15
PROC3	TRA Workers 3.0		Chronic dermal local exposure	0.12 mg/cm2	0.08
PROC3	TRA Workers 3.0		Dermal: acute, local	0.12 mg/cm2	0.08
PROC5, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m <sup>3</sup>	0.49
PROC5	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m <sup>3</sup>	0.33
PROC5	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/kg bw/day	0.31

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PROC5	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC2, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC2	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC2	TRA Workers 3.0		Dermal: long-term, systemic	0.14 mg/kg bw/day	0.05
PROC2	TRA Workers 3.0		Chronic dermal local exposure	0.02 mg/cm <sup>2</sup>	0.01
PROC2	TRA Workers 3.0		Dermal: acute, local	0.02 mg/cm <sup>2</sup>	0.01
PROC4, PROC8a, PROC9, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 0.70 mg/m <sup>3</sup>	<= 0.23
PROC4, PROC8a, PROC9	TRA Workers 3.0		Inhalation: short-term, systemic	<= 2.81 mg/m <sup>3</sup>	<= 0.16
PROC4, PROC8a, PROC9	TRA Workers 3.0		Dermal: long-term, systemic	<= 1.37 mg/kg bw/day	<= 0.51
PROC4, PROC8a, PROC9	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC4, PROC8a, PROC9	TRA Workers 3.0		Dermal: acute, local	<= 0.1 mg/cm <sup>2</sup>	<= 0.06
PROC8b, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.25 mg/m <sup>3</sup>	0.08
PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	0.98 mg/m <sup>3</sup>	0.06
PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	1.37 mg/kg bw/day	0.51
PROC8b	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC8b	TRA Workers 3.0		Dermal: acute, local	0.1 mg/cm <sup>2</sup>	0.06
PROC14, PROC15, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.45 mg/m <sup>3</sup>	0.82
PROC14, PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/m <sup>3</sup>	0.55
PROC14, PROC15	TRA Workers 3.0		Dermal: long-term, systemic	<= 0.34 mg/kg bw/d	<= 0.13
PROC14, PROC15	TRA Workers 3.0		Chronic dermal local exposure	<= 0.05 mg/cm <sup>2</sup>	<= 0.03
PROC14, PROC15	TRA Workers 3.0		Dermal: acute, local	<= 0.05 mg/cm <sup>2</sup>	<= 0.03
PROC19, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC19	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC19	TRA Workers 3.0		Dermal: long-term, systemic	1.41 mg/kg bw/d	0.52
PROC19	TRA Workers 3.0		Chronic dermal local exposure	0.05 mg/cm <sup>2</sup>	0.03
PROC19	TRA Workers 3.0		Dermal: acute, local	0.05 mg/cm <sup>2</sup>	0.03

Further details on SpERCs, scaling, releases and control technologies are provided in IFRA Guidance "REACH Exposure Scenarios for Fragrance Substances"

For complete exposure estimation, the values for different routes of exposure and activities may have to be summed up.

assumes operating temperature: <= 40 °C

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## **4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario**

EUSES = EUSES version 2.1.1

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## ES 17: (AISE) Formulation of Detergents/Maintenance Products: Granular Compact (small scale)

### 1. Scenario description

Main User Groups	: <b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites
Chemical product category	: <b>PC28:</b> Perfumes, fragrances <b>PC31:</b> Polishes and wax blends <b>PC35:</b> Washing and cleaning products (including solvent based products)
Process categories	: <b>PROC1:</b> Use in closed process, no likelihood of exposure <b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure <b>PROC3:</b> Use in closed batch process (synthesis or formulation) <b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises <b>PROC5:</b> Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) <b>PROC8a:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities <b>PROC8b:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities <b>PROC9:</b> Transfer of substance or preparation into small containers (dedicated filling line, including weighing) <b>PROC14:</b> Production of preparations or articles by tableting, compression, extrusion, pelletisation <b>PROC15:</b> Use as laboratory reagent <b>PROC19:</b> Hand-mixing with intimate contact and only PPE available
Environmental Release Categories	: <b>ERC2:</b> Formulation of preparations
Further information	: Cosmetics Europe / COLIPA

### 2.1 Contributing scenario controlling environmental exposure for: ERC2

#### Product characteristics

Viscosity, dynamic : 7.28 mPa.s (at 20 °C)

#### Amount used

Daily amount per site : 200 kg  
Annual amount per site (Msafe) : 50 t  
Remarks : Msafe is the maximum amount of substance or product which may be used safely under the conditions defined in the environmental part of the exposure scenario.

#### Frequency and duration of use

Continuous exposure : 250 days/year

#### Environment factors not influenced by risk management

Flow rate of receiving surface wa- : 18,000 m3/d



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### Other given operational conditions affecting environmental exposure

Emission or Release Factor: Air : 0.0 %  
Emission or Release Factor: Water : 0.2 %  
Emission or Release Factor: Soil : 0.0 %

### Technical conditions and measures / Organizational measures

Water : All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.

### Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant : Municipal sewage treatment plant  
Flow rate of sewage treatment plant effluent : 2,000 m3/d  
Effectiveness (of a measure) : 87.7 %  
Sludge Treatment : Can be applied on agricultural soil, when in compliance with local regulations.

### Conditions and measures related to external treatment of waste for disposal

Disposal methods : Dispose of as hazardous waste in compliance with local and national regulations.

---

## 2.2 Contributing scenario controlling worker exposure for: PROC1, Liquid mixture

---

Activity : Product delivery/storage - product storage - indoor, Loading of application equipment - batch, indoor (liquid products)

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

---

## 2.3 Contributing scenario controlling worker exposure for: PROC2, PROC3, Liquid mixture

---

Activity : Process sampling

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

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## 2.4 Contributing scenario controlling worker exposure for: PROC5, PROC8b, Liquid mixture

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Activity : Process sampling

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness (of a measure): 90 %)

---

## 2.5 Contributing scenario controlling worker exposure for: PROC15, Liquid mixture

---

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

---

## 2.6 Contributing scenario controlling worker exposure for: PROC2, Liquid mixture

---

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

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### 2.7 Contributing scenario controlling worker exposure for: PROC4, PROC8a, PROC8b, PROC9, Liquid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Liquid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

#### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

### 2.8 Contributing scenario controlling worker exposure for: PROC15, Liquid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Liquid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

#### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

### 2.9 Contributing scenario controlling worker exposure for: PROC19, Liquid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Liquid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

#### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)  
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness (of a measure): 90 %)

### 2.10 Contributing scenario controlling worker exposure for: PROC3, Solid mixture

Activity : Process sampling

#### Product characteristics

Concentration of the Substance in : Covers the percentage of the substance in the product up to

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Mixture/Article : 25 %.  
Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.11 Contributing scenario controlling worker exposure for: PROC5, Solid mixture

Activity : Process sampling

### Product characteristics

Concentration of the Substance in : Covers the percentage of the substance in the product up to  
Mixture/Article 25 %.  
Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)  
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
(Effectiveness (of a measure): 90 %)

## 2.12 Contributing scenario controlling worker exposure for: PROC2, Solid mixture

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.  
Mixture/Article  
Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## 2.13 Contributing scenario controlling worker exposure for: PROC4, PROC8a, PROC9, Solid mixture

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.  
Mixture/Article  
Physical Form (at time of use) : Solid mixture

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## Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

---

### 2.14 Contributing scenario controlling worker exposure for: PROC8b, Solid mixture

---

Activity : Process sampling

#### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Solid mixture

## Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

---

### 2.15 Contributing scenario controlling worker exposure for: PROC14, PROC15, Solid mixture

---

#### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Solid mixture

## Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

---

### 2.16 Contributing scenario controlling worker exposure for: PROC19, Solid mixture

---

#### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Solid mixture

## Frequency and duration of use

Frequency of use : <= 8 hours/day

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### Other operational conditions affecting workers exposure

Outdoor / Indoor

: Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
(Effectiveness (of a measure): 90 %)

## 3. Exposure estimation and reference to its source

### Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure (PEC)	RCR
ERC2	EUSES		Fresh water		0.003 mg/l	0.12
			Fresh water sediment		0.03 mg/kg dry weight	0.12
			Marine water		0.0003 mg/l	0.12
			Marine sediment		0.003 mg/kg dry weight	0.12
			Sewage treatment plant		0.03 mg/l	< 0.01
			Soil		0.003 mg/kg dry weight	0.10

### Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PROC1, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.04 mg/m <sup>3</sup>	0.01
PROC1	TRA Workers 3.0		Inhalation: short-term, systemic	0.17 mg/m <sup>3</sup>	< 0.01
PROC1	TRA Workers 3.0		Dermal: long-term, systemic	0.02 mg/kg bw/d	< 0.01
PROC1	TRA Workers 3.0		Chronic dermal local exposure	0.006 mg/cm <sup>2</sup>	< 0.01
PROC1	TRA Workers 3.0		Dermal: acute, local	0.006 mg/cm <sup>2</sup>	< 0.01
PROC2, PROC3, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 1.26 mg/m <sup>3</sup>	<= 0.42
PROC2, PROC3	TRA Workers 3.0		Inhalation: short-term, systemic	5.05 mg/m <sup>3</sup>	<= 0.28
PROC2, PROC3	TRA Workers 3.0		Dermal: long-term, systemic	<= 0.82 mg/kg bw/day	<= 0.30
PROC2, PROC3	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC2, PROC3	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5, PROC8b, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m <sup>3</sup>	0.49
PROC5, PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m <sup>3</sup>	0.33
PROC5, PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/kg bw/day	0.31
PROC5, PROC8b	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5, PROC8b	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08

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PROC15, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.10 mg/m <sup>3</sup>	0.70
PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	8.41 mg/cm <sup>2</sup>	0.47
PROC15	TRA Workers 3.0		Dermal: long-term, systemic	0.20 mg/kg bw/day	0.08
PROC15	TRA Workers 3.0		Chronic dermal local exposure	0.06 mg/cm <sup>2</sup>	0.04
PROC15	TRA Workers 3.0		Dermal: acute, local	0.06 mg/cm <sup>2</sup>	0.04
PROC2, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC2	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC2	TRA Workers 3.0		Dermal: long-term, systemic	0.14 mg/kg bw/day	0.05
PROC2	TRA Workers 3.0		Chronic dermal local exposure	0.02 mg/cm <sup>2</sup>	0.01
PROC2	TRA Workers 3.0		Dermal: acute, local	0.02 mg/cm <sup>2</sup>	0.01
PROC4, PROC8a, PROC8b, PROC9, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 0.70 mg/m <sup>3</sup>	<= 0.23
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Inhalation: short-term, systemic	<= 2.81 mg/m <sup>3</sup>	<= 0.16
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Dermal: long-term, systemic	<= 1.37 mg/kg bw/day	<= 0.51
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Dermal: acute, local	<= 0.1 mg/cm <sup>2</sup>	<= 0.06
PROC15, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.45 mg/m <sup>3</sup>	0.82
PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/m <sup>3</sup>	0.55
PROC15	TRA Workers 3.0		Dermal: long-term, systemic	0.03 mg/kg bw/d	0.01
PROC15	TRA Workers 3.0		Chronic dermal local exposure	0.01 mg/cm <sup>2</sup>	< 0.01
PROC15	TRA Workers 3.0		Dermal: acute, local	0.01 mg/cm <sup>2</sup>	< 0.01
PROC19, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC19	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC19	TRA Workers 3.0		Dermal: long-term, systemic	1.41 mg/kg bw/d	0.52
PROC19	TRA Workers 3.0		Chronic dermal local exposure	0.05 mg/cm <sup>2</sup>	0.03
PROC19	TRA Workers 3.0		Dermal: acute, local	0.05 mg/cm <sup>2</sup>	0.03
PROC3, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.26 mg/m <sup>3</sup>	0.42
PROC3	TRA Workers 3.0		Inhalation: short-term, systemic	5.05 mg/m <sup>3</sup>	0.28
PROC3	TRA Workers 3.0		Dermal: long-term, systemic	0.41 mg/kg bw/day	0.15
PROC3	TRA Workers 3.0		Chronic dermal local exposure	0.12 mg/cm <sup>2</sup>	0.08
PROC3	TRA Workers 3.0		Dermal: acute, local	0.12 mg/cm <sup>2</sup>	0.08
PROC5, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m <sup>3</sup>	0.49
PROC5	TRA Workers		Inhalation: short-term,	5.89 mg/m <sup>3</sup>	0.33

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	3.0		systemic		
PROC5	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/kg bw/day	0.31
PROC5	TRA Workers 3.0		Chronic dermal local exposure	$\leq 0.12$ mg/cm <sup>2</sup>	$\leq 0.08$
PROC5	TRA Workers 3.0		Dermal: acute, local	$\leq 0.12$ mg/cm <sup>2</sup>	$\leq 0.08$
PROC2, Solid mixture	TRA Workers 3.0	Worker (Indus- trial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC2	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC2	TRA Workers 3.0		Dermal: long-term, systemic	0.14 mg/kg bw/day	0.05
PROC2	TRA Workers 3.0		Chronic dermal local exposure	0.02 mg/cm <sup>2</sup>	0.01
PROC2	TRA Workers 3.0		Dermal: acute, local	0.02 mg/cm <sup>2</sup>	0.01
PROC4, PROC8a, PROC9, Solid mixture	TRA Workers 3.0	Worker (Indus- trial)	Inhalation: long-term, systemic	$\leq 0.70$ mg/m <sup>3</sup>	$\leq 0.23$
PROC4, PROC8a, PROC9	TRA Workers 3.0		Inhalation: short-term, systemic	$\leq 2.81$ mg/m <sup>3</sup>	$\leq 0.16$
PROC4, PROC8a, PROC9	TRA Workers 3.0		Dermal: long-term, systemic	$\leq 1.37$ mg/kg bw/day	$\leq 0.51$
PROC4, PROC8a, PROC9	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC4, PROC8a, PROC9	TRA Workers 3.0		Dermal: acute, local	$\leq 0.1$ mg/cm <sup>2</sup>	$\leq 0.06$
PROC8b, Solid mix- ture	TRA Workers 3.0	Worker (Indus- trial)	Inhalation: long-term, systemic	0.25 mg/m <sup>3</sup>	0.08
PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	0.98 mg/m <sup>3</sup>	0.06
PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	1.37 mg/kg bw/day	0.51
PROC8b	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC8b	TRA Workers 3.0		Dermal: acute, local	0.1 mg/cm <sup>2</sup>	0.06
PROC14, PROC15, Solid mixture	TRA Workers 3.0	Worker (Indus- trial)	Inhalation: long-term, systemic	2.45 mg/m <sup>3</sup>	0.82
PROC14, PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/m <sup>3</sup>	0.55
PROC14, PROC15	TRA Workers 3.0		Dermal: long-term, systemic	$\leq 0.34$ mg/kg bw/d	$\leq 0.13$
PROC14, PROC15	TRA Workers 3.0		Chronic dermal local exposure	$\leq 0.05$ mg/cm <sup>2</sup>	$\leq 0.03$
PROC14, PROC15	TRA Workers 3.0		Dermal: acute, local	$\leq 0.05$ mg/cm <sup>2</sup>	$\leq 0.03$
PROC19, Solid mix- ture	TRA Workers 3.0	Worker (Indus- trial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC19	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC19	TRA Workers 3.0		Dermal: long-term, systemic	1.41 mg/kg bw/d	0.52
PROC19	TRA Workers 3.0		Chronic dermal local exposure	0.05 mg/cm <sup>2</sup>	0.03
PROC19	TRA Workers 3.0		Dermal: acute, local	0.05 mg/cm <sup>2</sup>	0.03

Further details on SpERCs, scaling, releases and control technologies are provided in IFRA Guidance "REACH Exposure Scenarios for Fragrance Substances"

For complete exposure estimation, the values for different routes of exposure and activities may have to be summed up.



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assumes operating temperature:  $\leq 40\text{ }^{\circ}\text{C}$

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## 4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

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EUSES = EUSES version 2.1.1

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## **ES 18: (AISE) Formulation of Detergents/Maintenance Products: Granular Regular (small scale), Low Viscosity Liquids (small scale)**

### **1. Scenario description**

Main User Groups	: <b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites
Chemical product category	: <b>PC28:</b> Perfumes, fragrances <b>PC35:</b> Washing and cleaning products (including solvent based products) <b>PC31:</b> Polishes and wax blends
Process categories	: <b>PROC1:</b> Use in closed process, no likelihood of exposure <b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure <b>PROC3:</b> Use in closed batch process (synthesis or formulation) <b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises <b>PROC5:</b> Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) <b>PROC8a:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities <b>PROC8b:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities <b>PROC9:</b> Transfer of substance or preparation into small containers (dedicated filling line, including weighing) <b>PROC14:</b> Production of preparations or articles by tableting, compression, extrusion, pelletisation <b>PROC15:</b> Use as laboratory reagent <b>PROC19:</b> Hand-mixing with intimate contact and only PPE available
Environmental Release Categories	: <b>ERC2:</b> Formulation of preparations
Further information	: Cosmetics Europe / COLIPA

### **2.1 Contributing scenario controlling environmental exposure for: ERC2**

#### **Product characteristics**

Viscosity, dynamic	: 7.28 mPa.s (at 20 °C)
Annual amount per site (Msafe)	: 36.9 t
Remarks	: Msafe is the maximum amount of substance or product which may be used safely under the conditions defined in the environmental part of the exposure scenario.

#### **Frequency and duration of use**

Continuous exposure	: 250 days/year
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#### **Environment factors not influenced by risk management**

Flow rate of receiving surface water	: 18,000 m <sup>3</sup> /d
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## Other given operational conditions affecting environmental exposure

Emission or Release Factor: Air : 0.0 %  
Emission or Release Factor: Water : 0.2 %  
Emission or Release Factor: Soil : 0.0 %

## Technical conditions and measures / Organizational measures

Water : All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.

## Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant : Municipal sewage treatment plant  
Flow rate of sewage treatment plant effluent : 2,000 m3/d  
Effectiveness (of a measure) : 87.7 %  
Sludge Treatment : Can be applied on agricultural soil, when in compliance with local regulations.

## Conditions and measures related to external treatment of waste for disposal

Disposal methods : Dispose of as hazardous waste in compliance with local and national regulations.

---

## 2.2 Contributing scenario controlling worker exposure for: PROC1, Liquid mixture

---

Activity : Product delivery/storage - product storage - indoor, Loading of application equipment - batch, indoor (liquid products)

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

---

## 2.3 Contributing scenario controlling worker exposure for: PROC2, PROC3, Liquid mixture

---

Activity : Process sampling

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

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### 2.4 Contributing scenario controlling worker exposure for: PROC5, PROC8b, Liquid mixture

Activity : Process sampling

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Liquid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

#### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

#### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness (of a measure): 90 %)

### 2.5 Contributing scenario controlling worker exposure for: PROC15, Liquid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Liquid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

#### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

### 2.6 Contributing scenario controlling worker exposure for: PROC2, Liquid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Liquid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### 2.7 Contributing scenario controlling worker exposure for: PROC4, PROC8a, PROC8b, PROC9, Liquid mixture

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### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.8 Contributing scenario controlling worker exposure for: PROC15, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## 2.9 Contributing scenario controlling worker exposure for: PROC19, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)  
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
(Effectiveness (of a measure): 90 %)

## 2.10 Contributing scenario controlling worker exposure for: PROC3, Solid mixture

Activity : Process sampling

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Solid mixture

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## Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

### 2.11 Contributing scenario controlling worker exposure for: PROC5, Solid mixture

Activity : Process sampling

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Solid mixture

## Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)  
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
(Effectiveness (of a measure): 90 %)

### 2.12 Contributing scenario controlling worker exposure for: PROC2, Solid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Solid mixture

## Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### 2.13 Contributing scenario controlling worker exposure for: PROC4, PROC8a, PROC9, Solid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Solid mixture

## Frequency and duration of use

Frequency of use : <= 8 hours/day

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## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

---

## 2.14 Contributing scenario controlling worker exposure for: PROC8b, Solid mixture

---

Activity : Process sampling

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

---

## 2.15 Contributing scenario controlling worker exposure for: PROC14, PROC15, Solid mixture

---

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

---

## 2.16 Contributing scenario controlling worker exposure for: PROC19, Solid mixture

---

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

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### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

(Effectiveness (of a measure): 90 %)

### 3. Exposure estimation and reference to its source

#### Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure (PEC)	RCR
ERC2	EUSES		Fresh water		0.002 mg/l	0.09
			Fresh water sediment		0.02 mg/kg dry weight	0.09
			Marine water		0.0002 mg/l	0.09
			Marine sediment		0.002 mg/kg dry weight	0.09
			Sewage treatment plant		0.02 mg/l	< 0.01
			Soil		0.002 mg/kg dry weight	0.08

#### Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PROC1, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.04 mg/m <sup>3</sup>	0.01
PROC1	TRA Workers 3.0		Inhalation: short-term, systemic	0.17 mg/m <sup>3</sup>	< 0.01
PROC1	TRA Workers 3.0		Dermal: long-term, systemic	0.02 mg/kg bw/d	< 0.01
PROC1	TRA Workers 3.0		Chronic dermal local exposure	0.006 mg/cm <sup>2</sup>	< 0.01
PROC1	TRA Workers 3.0		Dermal: acute, local	0.006 mg/cm <sup>2</sup>	< 0.01
PROC2, PROC3, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 1.26 mg/m <sup>3</sup>	<= 0.42
PROC2, PROC3	TRA Workers 3.0		Inhalation: short-term, systemic	5.05 mg/m <sup>3</sup>	<= 0.28
PROC2, PROC3	TRA Workers 3.0		Dermal: long-term, systemic	<= 0.82 mg/kg bw/day	<= 0.30
PROC2, PROC3	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC2, PROC3	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5, PROC8b, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m <sup>3</sup>	0.49
PROC5, PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m <sup>3</sup>	0.33
PROC5, PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/kg bw/day	0.31
PROC5, PROC8b	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5, PROC8b	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC15, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.10 mg/m <sup>3</sup>	0.70
PROC15	TRA Workers		Inhalation: short-term,	8.41 mg/cm <sup>2</sup>	0.47



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	3.0		systemic		
PROC15	TRA Workers 3.0		Dermal: long-term, systemic	0.20 mg/kg bw/day	0.08
PROC15	TRA Workers 3.0		Chronic dermal local exposure	0.06 mg/cm2	0.04
PROC15	TRA Workers 3.0		Dermal: acute, local	0.06 mg/cm2	0.04
PROC2, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m3	0.23
PROC2	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m3	0.16
PROC2	TRA Workers 3.0		Dermal: long-term, systemic	0.14 mg/kg bw/day	0.05
PROC2	TRA Workers 3.0		Chronic dermal local exposure	0.02 mg/cm2	0.01
PROC2	TRA Workers 3.0		Dermal: acute, local	0.02 mg/cm2	0.01
PROC4, PROC8a, PROC8b, PROC9, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 0.70 mg/m3	<= 0.23
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Inhalation: short-term, systemic	<= 2.81 mg/m3	<= 0.16
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Dermal: long-term, systemic	<= 1.37 mg/kg bw/day	<= 0.51
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm2	0.06
PROC4, PROC8a, PROC8b, PROC9	TRA Workers 3.0		Dermal: acute, local	<= 0.1 mg/cm2	<= 0.06
PROC15, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.45 mg/m3	0.82
PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/m3	0.55
PROC15	TRA Workers 3.0		Dermal: long-term, systemic	0.03 mg/kg bw/d	0.01
PROC15	TRA Workers 3.0		Chronic dermal local exposure	0.01 mg/cm2	< 0.01
PROC15	TRA Workers 3.0		Dermal: acute, local	0.01 mg/cm2	< 0.01
PROC19, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m3	0.23
PROC19	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m3	0.16
PROC19	TRA Workers 3.0		Dermal: long-term, systemic	1.41 mg/kg bw/d	0.52
PROC19	TRA Workers 3.0		Chronic dermal local exposure	0.05 mg/cm2	0.03
PROC19	TRA Workers 3.0		Dermal: acute, local	0.05 mg/cm2	0.03
PROC3, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.26 mg/m3	0.42
PROC3	TRA Workers 3.0		Inhalation: short-term, systemic	5.05 mg/m3	0.28
PROC3	TRA Workers 3.0		Dermal: long-term, systemic	0.41 mg/kg bw/day	0.15
PROC3	TRA Workers 3.0		Chronic dermal local exposure	0.12 mg/cm2	0.08
PROC3	TRA Workers 3.0		Dermal: acute, local	0.12 mg/cm2	0.08
PROC5, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m3	0.49
PROC5	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m3	0.33
PROC5	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/kg bw/day	0.31

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PROC5	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC5	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm <sup>2</sup>	<= 0.08
PROC2, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC2	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC2	TRA Workers 3.0		Dermal: long-term, systemic	0.14 mg/kg bw/day	0.05
PROC2	TRA Workers 3.0		Chronic dermal local exposure	0.02 mg/cm <sup>2</sup>	0.01
PROC2	TRA Workers 3.0		Dermal: acute, local	0.02 mg/cm <sup>2</sup>	0.01
PROC4, PROC8a, PROC9, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 0.70 mg/m <sup>3</sup>	<= 0.23
PROC4, PROC8a, PROC9	TRA Workers 3.0		Inhalation: short-term, systemic	<= 2.81 mg/m <sup>3</sup>	<= 0.16
PROC4, PROC8a, PROC9	TRA Workers 3.0		Dermal: long-term, systemic	<= 1.37 mg/kg bw/day	<= 0.51
PROC4, PROC8a, PROC9	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC4, PROC8a, PROC9	TRA Workers 3.0		Dermal: acute, local	<= 0.1 mg/cm <sup>2</sup>	<= 0.06
PROC8b, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.25 mg/m <sup>3</sup>	0.08
PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	0.98 mg/m <sup>3</sup>	0.06
PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	1.37 mg/kg bw/day	0.51
PROC8b	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC8b	TRA Workers 3.0		Dermal: acute, local	0.1 mg/cm <sup>2</sup>	0.06
PROC14, PROC15, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.45 mg/m <sup>3</sup>	0.82
PROC14, PROC15	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/m <sup>3</sup>	0.55
PROC14, PROC15	TRA Workers 3.0		Dermal: long-term, systemic	<= 0.34 mg/kg bw/d	<= 0.13
PROC14, PROC15	TRA Workers 3.0		Chronic dermal local exposure	<= 0.05 mg/cm <sup>2</sup>	<= 0.03
PROC14, PROC15	TRA Workers 3.0		Dermal: acute, local	<= 0.05 mg/cm <sup>2</sup>	<= 0.03
PROC19, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC19	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC19	TRA Workers 3.0		Dermal: long-term, systemic	1.41 mg/kg bw/d	0.52
PROC19	TRA Workers 3.0		Chronic dermal local exposure	0.05 mg/cm <sup>2</sup>	0.03
PROC19	TRA Workers 3.0		Dermal: acute, local	0.05 mg/cm <sup>2</sup>	0.03

Further details on SpERCs, scaling, releases and control technologies are provided in IFRA Guidance "REACH Exposure Scenarios for Fragrance Substances"

For complete exposure estimation, the values for different routes of exposure and activities may have to be summed up.

assumes operating temperature: <= 40 °C

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## **4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario**

EUSES = EUSES version 2.1.1

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## ES 19: (AISE) Formulation of air care products

### 1. Scenario description

Main User Groups	: <b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites
Chemical product category	: <b>PC3:</b> Air care products
Process categories	: <b>PROC1:</b> Use in closed process, no likelihood of exposure <b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure <b>PROC3:</b> Use in closed batch process (synthesis or formulation) <b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises <b>PROC5:</b> Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) <b>PROC8a:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities <b>PROC8b:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities <b>PROC9:</b> Transfer of substance or preparation into small containers (dedicated filling line, including weighing) <b>PROC14:</b> Production of preparations or articles by tableting, compression, extrusion, pelletisation <b>PROC19:</b> Hand-mixing with intimate contact and only PPE available
Environmental Release Categories	: <b>ERC2:</b> Formulation of preparations
Further information	: Cosmetics Europe / COLIPA

### 2.1 Contributing scenario controlling environmental exposure for: ERC2

#### Product characteristics

Viscosity, dynamic	: 7.28 mPa.s (at 20 °C)
Annual amount per site (Msafe)	: 18.5 t
Remarks	: Msafe is the maximum amount of substance or product which may be used safely under the conditions defined in the environmental part of the exposure scenario.

#### Frequency and duration of use

Continuous exposure	: 250 days/year
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#### Environment factors not influenced by risk management

Flow rate of receiving surface water	: 18,000 m <sup>3</sup> /d
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#### Other given operational conditions affecting environmental exposure

Emission or Release Factor: Air	: 2.5 %
Emission or Release Factor: Water	: 2 %
Emission or Release Factor: Soil	: 0.01 %

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### Technical conditions and measures / Organizational measures

Water : All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.

### Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant : Municipal sewage treatment plant  
Flow rate of sewage treatment plant effluent : 2,000 m<sup>3</sup>/d  
Effectiveness (of a measure) : 87.7 %  
Sludge Treatment : Can be applied on agricultural soil, when in compliance with local regulations.

### Conditions and measures related to external treatment of waste for disposal

Disposal methods : Dispose of as hazardous waste in compliance with local and national regulations.

---

## 2.2 Contributing scenario controlling worker exposure for: PROC1, Liquid substance

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### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).  
Physical Form (at time of use) : Liquid substance

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

---

## 2.3 Contributing scenario controlling worker exposure for: PROC2, PROC3, Liquid mixture

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### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

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## 2.4 Contributing scenario controlling worker exposure for: PROC4, PROC9, PROC14, Liquid mixture

---

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Liquid mixture

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### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear suitable gloves tested to EN374. (Effectiveness (of a measure): 80 %)

## 2.5 Contributing scenario controlling worker exposure for: PROC5, PROC8b, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

### Organisational measures to prevent /limit releases, dispersion and exposure

Ensure operatives are trained to minimise exposures.

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
(Effectiveness (of a measure): 90 %)

## 2.6 Contributing scenario controlling worker exposure for: PROC8a, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear suitable gloves tested to EN374. (Effectiveness (of a measure): 80 %)

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### 2.7 Contributing scenario controlling worker exposure for: PROC19, Liquid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

Physical Form (at time of use) : Liquid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

#### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

#### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 95 %)

Wear suitable gloves tested to EN374. (Effectiveness (of a measure): 80 %)

### 3. Exposure estimation and reference to its source

#### Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure (PEC)	RCR
ERC2	EUSES		Fresh water		0.009 mg/l	0.41
			Fresh water sediment		0.09 mg/kg dry weight	0.41
			Marine water		0.0009 mg/l	0.41
			Marine sediment		0.009 mg/kg dry weight	0.41
			Sewage treatment plant		0.09 mg/l	< 0.01
			Soil		0.01 mg/kg dry weight	0.39

#### Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PROC1, Liquid substance	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.07 mg/m <sup>3</sup>	0.02
PROC1	TRA Workers 3.0		Inhalation: short-term, systemic	0.28 mg/m <sup>3</sup>	0.02
PROC1	TRA Workers 3.0		Dermal: long-term, systemic	0.03 mg/kg bw/d	0.01
PROC1	TRA Workers 3.0		Chronic dermal local exposure	0.01 mg/cm <sup>2</sup>	< 0.01
PROC1	TRA Workers 3.0		Dermal: acute, local	0.01 mg/cm <sup>2</sup>	< 0.01
PROC2, PROC3, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 1.26 mg/m <sup>3</sup>	0.42
PROC2, PROC3	TRA Workers 3.0		Inhalation: short-term, systemic	<= 5.05 mg/m <sup>3</sup>	<= 0.28
PROC2, PROC3	TRA Workers		Dermal: long-term,	<= 0.82 mg/kg	<= 0.30

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	3.0		systemic	bw/d	
PROC2, PROC3	TRA Workers 3.0		Chronic dermal local exposure	0.12 mg/cm2	0.08
PROC2, PROC3	TRA Workers 3.0		Dermal: acute, local	0.12 mg/cm2	0.08
PROC4, PROC9, PROC14, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m <sup>3</sup>	0.49
PROC4, PROC9, PROC14	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m <sup>3</sup>	0.33
PROC4, PROC9, PROC14	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/kg bw/day	0.31
PROC4, PROC9, PROC14	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm2	<= 0.08
PROC4, PROC9, PROC14	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm2	<= 0.08
PROC5, PROC8b, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m <sup>3</sup>	0.49
PROC5, PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m <sup>3</sup>	0.33
PROC5, PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	0.82 mg/kg bw/day	0.31
PROC5, PROC8b	TRA Workers 3.0		Chronic dermal local exposure	<= 0.12 mg/cm2	<= 0.08
PROC5, PROC8b	TRA Workers 3.0		Dermal: acute, local	<= 0.12 mg/cm2	<= 0.08
PROC8a, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.42 mg/m <sup>3</sup>	0.14
PROC8a	TRA Workers 3.0		Inhalation: short-term, systemic	1.68 mg/m <sup>3</sup>	0.09
PROC8a	TRA Workers 3.0		Dermal: long-term, systemic	1.65 mg/kg bw/day	0.61
PROC8a	TRA Workers 3.0		Chronic dermal local exposure	0.12 mg/cm2	0.08
PROC8a	TRA Workers 3.0		Dermal: acute, local	0.12 mg/cm2	0.08
PROC19, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m <sup>3</sup>	0.49
PROC19	TRA Workers 3.0		Inhalation: short-term, systemic	5.89 mg/m <sup>3</sup>	0.33
PROC19	TRA Workers 3.0		Dermal: long-term, systemic	1.12 mg/kg bw/d	0.42
PROC19	TRA Workers 3.0		Chronic dermal local exposure	0.6 mg/cm2	0.38
PROC19	TRA Workers 3.0		Dermal: acute, local	0.6 mg/cm2	0.38

### 4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

EUSES = EUSES version 2.1.1



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## ES 20: Formulation

### 1. Scenario description

Main User Groups	: <b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	: <b>PROC1:</b> Use in closed process, no likelihood of exposure <b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure <b>PROC3:</b> Use in closed batch process (synthesis or formulation) <b>PROC5:</b> Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) <b>PROC8a:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities <b>PROC8b:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities <b>PROC9:</b> Transfer of substance or preparation into small containers (dedicated filling line, including weighing) <b>PROC14:</b> Production of preparations or articles by tableting, compression, extrusion, pelletisation <b>PROC15:</b> Use as laboratory reagent
Environmental Release Categories	: <b>ERC2:</b> Formulation of preparations
Further information	: Cosmetics Europe / COLIPA

### 2.1 Contributing scenario controlling environmental exposure for: ERC2

#### Product characteristics

Viscosity, dynamic	: 7.28 mPa.s (at 20 °C)
Annual amount per site (Msafe)	: 18.5 t
Remarks	: Msafe is the maximum amount of substance or product which may be used safely under the conditions defined in the environmental part of the exposure scenario.

#### Frequency and duration of use

Continuous exposure	: 250 days/year
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#### Environment factors not influenced by risk management

Flow rate of receiving surface water	: 18,000 m3/d
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#### Other given operational conditions affecting environmental exposure

Emission or Release Factor: Air	: 2.5 %
Emission or Release Factor: Water	: 2 %
Emission or Release Factor: Soil	: 0.01 %

#### Technical conditions and measures / Organizational measures

Water	: All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.
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### Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant	: Municipal sewage treatment plant
Flow rate of sewage treatment plant effluent	: 2,000 m3/d
Effectiveness (of a measure)	: 87.7 %
Sludge Treatment	: Can be applied on agricultural soil, when in compliance with local regulations.

### Conditions and measures related to external treatment of waste for disposal

Disposal methods	: Dispose of as hazardous waste in compliance with local and national regulations.
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## 2.2 Contributing scenario controlling worker exposure for: PROC1, Liquid substance

### Product characteristics

Concentration of the Substance in Mixture/Article	: Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	: Liquid substance

### Frequency and duration of use

Frequency of use	: <= 8 hours/day
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### Other operational conditions affecting workers exposure

Outdoor / Indoor	: Indoor use
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## 2.3 Contributing scenario controlling worker exposure for: PROC2, PROC3, Liquid substance

### Product characteristics

Concentration of the Substance in Mixture/Article	: Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	: Liquid substance

### Frequency and duration of use

Frequency of use	: <= 8 hours/day
------------------	------------------

### Other operational conditions affecting workers exposure

Outdoor / Indoor	: Indoor use
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### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.4 Contributing scenario controlling worker exposure for: PROC5, PROC8a, Liquid substance

### Product characteristics

Concentration of the Substance in Mixture/Article	: Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	: Liquid substance

### Frequency and duration of use

Frequency of use	: <= 8 hours/day
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### Other operational conditions affecting workers exposure

Outdoor / Indoor	: Indoor use
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## Technical conditions and measures

Provide appropriate exhaust ventilation at machinery. (Effectiveness (of a measure): 90 %)

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness (of a measure): 90 %)

## 2.5 Contributing scenario controlling worker exposure for: PROC8b, Liquid substance

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).  
Physical Form (at time of use) : Liquid substance

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Technical conditions and measures

Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). (Effectiveness (of a measure): 70 %)

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness (of a measure): 90 %)

## 2.6 Contributing scenario controlling worker exposure for: PROC9, Liquid substance, PROC14, Solid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).  
Physical Form (at time of use) : Liquid substance  
Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Technical conditions and measures

Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). (Effectiveness (of a measure): 70 %)

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear suitable gloves tested to EN374. (Effectiveness (of a measure): 80 %)

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### 2.7 Contributing scenario controlling worker exposure for: PROC8b, Liquid substance

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).  
Physical Form (at time of use) : Liquid substance

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

#### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

#### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

### 3. Exposure estimation and reference to its source

#### Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure (PEC)	RCR
ERC2	EUSES		Fresh water		0.009 mg/l	0.41
			Fresh water sediment		0.09 mg/kg dry weight	0.41
			Marine water		0.0009 mg/l	0.41
			Marine sediment		0.009 mg/kg dry weight	0.41
			Sewage treatment plant		0.09 mg/l	< 0.01
			Soil		0.01 mg/kg dry weight	0.39

#### Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PROC1, Liquid substance	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.07 mg/m <sup>3</sup>	0.02
PROC1	TRA Workers 3.0		Inhalation: short-term, systemic	0.28 mg/m <sup>3</sup>	0.02
PROC1	TRA Workers 3.0		Dermal: long-term, systemic	0.03 mg/kg bw/day	0.01
PROC1	TRA Workers 3.0		Chronic dermal local exposure	0.01 mg/cm <sup>2</sup>	< 0.01
PROC1	TRA Workers 3.0		Dermal: acute, local	0.01 mg/cm <sup>2</sup>	< 0.01
PROC2, PROC3, Liquid substance	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 2.10 mg/m <sup>3</sup>	<= 0.70
PROC2, PROC3	TRA Workers 3.0		Inhalation: short-term, systemic	<= 8.41 mg/m <sup>3</sup>	<= 0.47
PROC2, PROC3	TRA Workers 3.0		Dermal: long-term, systemic	<= 1.37 mg/kg bw/d	<= 0.51
PROC2, PROC3	TRA Workers 3.0		Chronic dermal local exposure	0.20 mg/cm <sup>2</sup>	0.13

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PROC2, PROC3	TRA Workers 3.0		Dermal: acute, local	0.20 mg/cm <sup>2</sup>	0.12
PROC5, PROC8b, Liquid substance	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 0.70 mg/m <sup>3</sup>	<= 0.23
PROC5, PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	<= 2.81 mg/m <sup>3</sup>	<= 0.16
PROC5, PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	1.37 mg/kg bw/day	0.51
PROC5, PROC8b	TRA Workers 3.0		Chronic dermal local exposure	<= 0.20 mg/cm <sup>2</sup>	<= 0.13
PROC5, PROC8b	TRA Workers 3.0		Dermal: acute, local	<= 0.20 mg/cm <sup>2</sup>	<= 0.13
PROC8b, Liquid substance	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.07 mg/m <sup>3</sup>	0.02
PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	0.28 mg/m <sup>3</sup>	0.02
PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	0.03 mg/kg bw/day	0.01
PROC8b	TRA Workers 3.0		Chronic dermal local exposure	0.01 mg/cm <sup>2</sup>	< 0.01
PROC8b	TRA Workers 3.0		Dermal: acute, local	0.01 mg/cm <sup>2</sup>	< 0.01
PROC9, Liquid substance, PROC14, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.05 mg/m <sup>3</sup>	0.35
PROC9, PROC14	TRA Workers 3.0		Inhalation: short-term, systemic	4.21 mg/m <sup>3</sup>	0.23
PROC9, PROC14	TRA Workers 3.0		Dermal: long-term, systemic	1.37 mg/kg bw/day	0.51
PROC9, PROC14	TRA Workers 3.0		Chronic dermal local exposure	<= 0.20 mg/cm <sup>2</sup>	<= 0.13
PROC9, PROC14	TRA Workers 3.0		Dermal: acute, local	<= 0.20 mg/cm <sup>2</sup>	<= 0.13
PROC8b, Liquid substance	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	2.45 mg/m <sup>3</sup>	0.82
PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/m <sup>3</sup>	0.55
PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	0.34 mg/kg bw/day	0.13
PROC8b	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC8b	TRA Workers 3.0		Dermal: acute, local	0.1 mg/cm <sup>2</sup>	0.06

assumes operating temperature: <= 40 °C

For complete exposure estimation, the values for different routes of exposure and activities may have to be summed up.

#### 4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

EUSES = EUSES version 2.1.1

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## ES 21: (AISE) Industrial use of detergents and maintenance products / Indoor

### 1. Scenario description

Main User Groups	: <b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites
Chemical product category	: <b>PC35:</b> Washing and cleaning products (including solvent based products)
Process categories	: <b>PROC1:</b> Use in closed process, no likelihood of exposure <b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure <b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises <b>PROC7:</b> Industrial spraying <b>PROC8a:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities <b>PROC8b:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities <b>PROC10:</b> Roller application or brushing <b>PROC13:</b> Treatment of articles by dipping and pouring
Environmental Release Categories	: <b>ERC4:</b> Industrial use of processing aids in processes and products, not becoming part of articles
Further information	: AISE = International Association for Soaps, Detergents and Maintenance Products

### 2.1 Contributing scenario controlling environmental exposure for: ERC4

#### Product characteristics

Viscosity, dynamic	: 7.28 mPa.s (at 20 °C)
Annual amount for wide disperse uses (Msafe)	: 850 kg
Remarks	: Msafe is the maximum amount of substance or product which may be used safely under the conditions defined in the environmental part of the exposure scenario.

#### Frequency and duration of use

Continuous exposure	: 250 days/year
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#### Environment factors not influenced by risk management

Flow rate of receiving surface water	: 18,000 m <sup>3</sup> /d
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#### Other given operational conditions affecting environmental exposure

Emission or Release Factor: Air	: 100 %
Emission or Release Factor: Water	: 100 %
Emission or Release Factor: Soil	: 5 %

#### Technical conditions and measures / Organizational measures

Water	: All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.
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## Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant	: Municipal sewage treatment plant
Flow rate of sewage treatment plant effluent	: 2,000 m3/d
Effectiveness (of a measure)	: 87.7 %
Sludge Treatment	: Can be applied on agricultural soil, when in compliance with local regulations.

## Conditions and measures related to external treatment of waste for disposal

Disposal methods	: Dispose of as hazardous waste in compliance with local and national regulations.
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## 2.2 Contributing scenario controlling worker exposure for: PROC1, Liquid substance

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### Product characteristics

Concentration of the Substance in Mixture/Article	: Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	: Liquid substance

### Frequency and duration of use

Frequency of use	: <= 8 hours/day
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### Other operational conditions affecting workers exposure

Outdoor / Indoor	: Indoor use
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## 2.3 Contributing scenario controlling worker exposure for: PROC1, Solid mixture

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Activity	: Manufacturing equipment maintenance: cleaning manufacturing equipment for maintenance purposes
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### Product characteristics

Concentration of the Substance in Mixture/Article	: Covers percentage substance in the product up to 1 %.
Physical Form (at time of use)	: Solid mixture

### Frequency and duration of use

Frequency of use	: <= 8 hours/day
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### Other operational conditions affecting workers exposure

Outdoor / Indoor	: Indoor use
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## 2.4 Contributing scenario controlling worker exposure for: PROC2, Liquid mixture

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### Product characteristics

Concentration of the Substance in Mixture/Article	: Covers percentage substance in the product up to 1 %.
Physical Form (at time of use)	: Liquid mixture

### Frequency and duration of use

Frequency of use	: <= 8 hours/day
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### Other operational conditions affecting workers exposure

Outdoor / Indoor	: Indoor use
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## 2.5 Contributing scenario controlling worker exposure for: PROC4, PROC8a, PROC8b, PROC13, Liquid mixture

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### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

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## 2.6 Contributing scenario controlling worker exposure for: PROC7, Liquid mixture

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### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). (Effectiveness (of a measure): 70 %)

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 95 %)  
Wear suitable gloves tested to EN374. (Effectiveness (of a measure): 80 %)

---

## 2.7 Contributing scenario controlling worker exposure for: PROC10, Liquid mixture

---

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)



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### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear suitable gloves tested to EN374.

### 2.8 Contributing scenario controlling worker exposure for: PROC8a, PROC8b, Solid mixture

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Solid mixture

#### Frequency and duration of use

Frequency of use : <= 8 hours/day

#### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

### 3. Exposure estimation and reference to its source

#### Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure (PEC)	RCR
ERC8a	EUSES		Fresh water		0.02 mg/l	0.92
			Fresh water sediment		0.21 mg/kg dry weight	0.92
			Marine water		0.002 mg/l	0.92
			Marine sediment		0.02 mg/kg dry weight	0.92
			Sewage treatment plant		0.21 mg/l	0.02
			Soil		0.03 mg/kg dry weight	0.89

#### Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PROC1, Liquid substance	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.07 mg/m <sup>3</sup>	0.02
PROC1	TRA Workers 3.0		Inhalation: short-term, systemic	0.28 mg/m <sup>3</sup>	0.02
PROC1			Dermal: long-term, systemic	0.03 mg/kg bw/day	0.01
PROC1			Chronic dermal local exposure	0.01 mg/cm <sup>2</sup>	< 0.01
PROC1			Dermal: acute, local	0.01 mg/cm <sup>2</sup>	< 0.01
PROC1, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.007 mg/m <sup>3</sup>	< 0.01
PROC1	TRA Workers 3.0		Inhalation: short-term, systemic	0.03 mg/m <sup>3</sup>	< 0.01
PROC1	TRA Workers 3.0		Dermal: long-term, systemic	0.003 mg/kg bw/day	< 0.01

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PROC1	TRA Workers 3.0		Chronic dermal local exposure	0.001 mg/cm <sup>2</sup>	< 0.01
PROC1	TRA Workers 3.0		Dermal: acute, local	0.001 mg/cm <sup>2</sup>	< 0.01
PROC2, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC2	TRA Workers 3.0		Inhalation: short-term, systemic	2.81 mg/m <sup>3</sup>	0.16
PROC2	TRA Workers 3.0		Dermal: long-term, systemic	0.14 mg/kg bw/day	0.05
PROC2	TRA Workers 3.0		Chronic dermal local exposure	0.02 mg/cm <sup>2</sup>	0.01
PROC2	TRA Workers 3.0		Dermal: acute, local	0.02 mg/cm <sup>2</sup>	0.01
PROC4, PROC8a, PROC8b, PROC13, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 0.70 mg/m <sup>3</sup>	<= 0.23
PROC4, PROC8a, PROC8b, PROC13	TRA Workers 3.0		Inhalation: short-term, systemic	<= 2.81 mg/m <sup>3</sup>	<= 0.16
PROC4, PROC8a, PROC8b, PROC13	TRA Workers 3.0		Dermal: long-term, systemic	<= 1.37 mg/kg bw/day	<= 0.51
PROC4, PROC8a, PROC8b, PROC13	TRA Workers 3.0		Chronic dermal local exposure	<= 0.2 mg/cm <sup>2</sup>	<= 0.13
PROC4, PROC8a, PROC8b, PROC13	TRA Workers 3.0		Dermal: acute, local	<= 0.2 mg/cm <sup>2</sup>	<= 0.13
PROC7, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.05 mg/m <sup>3</sup>	0.35
PROC7	TRA Workers 3.0		Inhalation: short-term, systemic	4.21 mg/m <sup>3</sup>	0.23
PROC7			Dermal: long-term, systemic	0.86 mg/kg bw/day	0.32
PROC7			Chronic dermal local exposure	0.04 mg/cm <sup>2</sup>	0.03
PROC7			Dermal: acute, local	0.04 mg/cm <sup>2</sup>	0.03
PROC10, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 0.70 mg/m <sup>3</sup>	<= 0.23
PROC10	TRA Workers 3.0		Inhalation: short-term, systemic	<= 2.81 mg/m <sup>3</sup>	<= 0.16
PROC10			Dermal: long-term, systemic	<= 0.55 mg/kg bw/day	<= 0.20
PROC10			Chronic dermal local exposure	<= 0.04 mg/cm <sup>2</sup>	<= 0.03
PROC10			Dermal: acute, local	<= 0.04 mg/cm <sup>2</sup>	<= 0.03
PROC8a, PROC8b, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 0.70 mg/m <sup>3</sup>	<= 0.23
PROC8a, PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	<= 2.81 mg/m <sup>3</sup>	<= 0.16
PROC8a, PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	1.37 mg/kg bw/day	0.51
PROC8a, PROC8b	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC8a, PROC8b	TRA Workers 3.0		Dermal: acute, local	0.1 mg/cm <sup>2</sup>	0.06

For complete exposure estimation, the values for different routes of exposure and activities may have to be summed up.

assumes operating temperature: <= 40 °C

#### 4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

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EUSES = EUSES version 2.1.1

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## **ES 22: (AISE) Industrial use of detergents and maintenance products / Outdoor**

### **1. Scenario description**

Main User Groups	: <b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites
Chemical product category	: <b>PC35:</b> Washing and cleaning products (including solvent based products)
Process categories	: <b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises <b>PROC7:</b> Industrial spraying <b>PROC8a:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities <b>PROC10:</b> Roller application or brushing
Environmental Release Categories	: <b>ERC4:</b> Industrial use of processing aids in processes and products, not becoming part of articles
Further information	: AISE = International Association for Soaps, Detergents and Maintenance Products

### **2.1 Contributing scenario controlling environmental exposure for: ERC4**

Activity	: Out-door use
<b>Product characteristics</b>	
Viscosity, dynamic	: 7.28 mPa.s (at 20 °C)
Annual amount for wide disperse uses (Msafe)	: 850 kg
Remarks	: Msafe is the maximum amount of substance or product which may be used safely under the conditions defined in the environmental part of the exposure scenario.

#### **Frequency and duration of use**

Continuous exposure	: 220 days/year
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#### **Environment factors not influenced by risk management**

Flow rate of receiving surface water	: 18,000 m <sup>3</sup> /d
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#### **Other given operational conditions affecting environmental exposure**

Emission or Release Factor: Air	: 100 %
Emission or Release Factor: Water	: 0.0 %
Emission or Release Factor: Soil	: 0.0 %

#### **Technical conditions and measures / Organizational measures**

Water	: All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.
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#### **Conditions and measures related to municipal sewage treatment plant**

Type of Sewage Treatment Plant	: Municipal sewage treatment plant
Flow rate of sewage treatment plant effluent	: 2,000 m <sup>3</sup> /d
Effectiveness (of a measure)	: 87.7 %

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Sludge Treatment : Can be applied on agricultural soil, when in compliance with local regulations.

### Conditions and measures related to external treatment of waste for disposal

Disposal methods : Dispose of as hazardous waste in compliance with local and national regulations.

## 2.2 Contributing scenario controlling worker exposure for: PROC4, PROC8a, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Solid mixture, Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Outdoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.3 Contributing scenario controlling worker exposure for: PROC7, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 4 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Outdoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 95 %)  
Wear suitable gloves tested to EN374. (Effectiveness (of a measure): 80 %)

## 2.4 Contributing scenario controlling worker exposure for: PROC8a, Solid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Outdoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

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## 2.5 Contributing scenario controlling worker exposure for: PROC10, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Outdoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)  
Wear suitable gloves tested to EN374. (Effectiveness (of a measure): 80 %)

## 3. Exposure estimation and reference to its source

### Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure (PEC)	RCR
ERC4	EUSES		Fresh water		0.02 mg/l	0.92
			Fresh water sediment		0.21 mg/kg dry weight	0.92
			Marine water		0.002 mg/l	0.92
			Marine sediment		0.02 mg/kg dry weight	0.92
			Sewage treatment plant		0.21 mg/l	0.02
			Soil		0.03 mg/kg dry weight	0.88

### Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PROC4, PROC8a, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	<= 0.49 mg/m <sup>3</sup>	<= 0.16
PROC4, PROC8a	TRA Workers 3.0		Inhalation: short-term, systemic	<= 1.96 mg/m <sup>3</sup>	<= 0.11
PROC4, PROC8a	TRA Workers 3.0		Dermal: long-term, systemic	<= 1.37 mg/kg bw/day	<= 0.51
PROC4, PROC8a	TRA Workers 3.0		Chronic dermal local exposure	<= 0.1 mg/cm <sup>2</sup>	<= 0.06
PROC4, PROC8a	TRA Workers 3.0		Dermal: acute, local	<= 0.1 mg/cm <sup>2</sup>	<= 0.06
PROC7, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	1.47 mg/m <sup>3</sup>	0.49
PROC7	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/m <sup>3</sup>	0.55
PROC7			Dermal: long-term, systemic	0.86 mg/kg bw/day	0.32
PROC7			Chronic dermal local exposure	0.04 mg/cm <sup>2</sup>	0.03

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PROC7			Dermal: acute, local	0.04 mg/cm <sup>2</sup>	0.03
PROC8a, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.49 mg/m <sup>3</sup>	0.16
PROC8a	TRA Workers 3.0		Inhalation: short-term, systemic	1.96 mg/m <sup>3</sup>	0.11
PROC8a	TRA Workers 3.0		Dermal: long-term, systemic	1.37 mg/kg bw/day	0.51
PROC8a	TRA Workers 3.0		Chronic dermal local exposure	0.1 mg/cm <sup>2</sup>	0.06
PROC8a	TRA Workers 3.0		Dermal: acute, local	0.1 mg/cm <sup>2</sup>	0.06
PROC10, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	0.49 mg/m <sup>3</sup>	0.16
PROC10	TRA Workers 3.0		Inhalation: short-term, systemic	1.96 mg/m <sup>3</sup>	0.11
PROC10			Dermal: long-term, systemic	0.55 mg/kg bw/day	0.20
PROC10			Chronic dermal local exposure	0.04 mg/cm <sup>2</sup>	0.03
PROC10			Dermal: acute, local	0.04 mg/cm <sup>2</sup>	0.03

assumes operating temperature: ≤ 40 °C

For complete exposure estimation, the values for different routes of exposure and activities may have to be summed up.

#### 4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

EUSES = EUSES version 2.1.1

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## ES 23: (AISE) Professional use in cleaning agents / Indoor

### 1. Scenario description

Main User Groups	: <b>SU 22:</b> Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Chemical product category	: <b>PC35:</b> Washing and cleaning products (including solvent based products)
Process categories	: <b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises <b>PROC8a:</b> Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at non-dedicated facilities <b>PROC8b:</b> Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities <b>PROC10:</b> Roller application or brushing <b>PROC11:</b> Non industrial spraying <b>PROC13:</b> Treatment of articles by dipping and pouring <b>PROC19:</b> Hand-mixing with intimate contact and only PPE available
Environmental Release Categories	: <b>ERC8a:</b> Wide dispersive indoor use of processing aids in open systems
Further information	: AISE = International Association for Soaps, Detergents and Maintenance Products

### 2.1 Contributing scenario controlling environmental exposure for: ERC8a

Activity	: In-door use
<b>Product characteristics</b>	
Viscosity, dynamic	: 7.28 mPa.s (at 20 °C)

#### Frequency and duration of use

Continuous exposure	: 365 days/year
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#### Environment factors not influenced by risk management

Flow rate of receiving surface water	: 18,000 m <sup>3</sup> /d
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#### Other given operational conditions affecting environmental exposure

Emission or Release Factor: Air	: 100 %
Emission or Release Factor: Water	: 100 %
Emission or Release Factor: Soil	: 0.0 %

#### Technical conditions and measures / Organizational measures

Water	: All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.
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#### Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant	: Municipal sewage treatment plant
Flow rate of sewage treatment plant effluent	: 2,000 m <sup>3</sup> /d
Effectiveness (of a measure)	: 87.7 %



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Sludge Treatment : Can be applied on agricultural soil, when in compliance with local regulations.

### Conditions and measures related to external treatment of waste for disposal

Disposal methods : Dispose of as hazardous waste in compliance with local and national regulations.

## 2.2 Contributing scenario controlling worker exposure for: PROC4, PROC8b, PROC13, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.3 Contributing scenario controlling worker exposure for: PROC8a, PROC8b, PROC19, Solid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Solid mixture

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection.

## 2.4 Contributing scenario controlling worker exposure for: PROC10, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

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Outdoor / Indoor

: Indoor use

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear suitable gloves tested to EN374. (Effectiveness (of a measure): 80 %)

## 2.5 Contributing scenario controlling worker exposure for: PROC11, Liquid mixture

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor

: Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 95 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
(Effectiveness (of a measure): 90 %)

## 2.6 Contributing scenario controlling worker exposure for: PROC19, Liquid mixture

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor

: Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
(Effectiveness (of a measure): 90 %)

## 2.7 Contributing scenario controlling worker exposure for: PROC8b, Solid mixture

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Solid mixture

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### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.8 Contributing scenario controlling worker exposure for: PROC19, Solid mixture

### Product characteristics

Concentration of the Substance in : Covers percentage substance in the product up to 1 %.

Mixture/Article

Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
(Effectiveness (of a measure): 90 %)

## 3. Exposure estimation and reference to its source

### Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure (PEC)	RCR
ERC8a	EUSES		Fresh water		0.0005 mg/l	0.02
			Fresh water sediment		0.005 mg/kg dry weight	0.02
			Marine water		0.00005 mg/l	0.02
			Marine sediment		0.0005 mg/kg dry weight	0.02
			Sewage treatment plant		0.003 mg/l	< 0.01
			Soil		0.0005 mg/kg dry weight	0.02

### Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PROC4, PROC8b, PROC13, Liquid mixture	TRA Workers 3.0	Worker (Professional)	Inhalation: long-term, systemic	0.70 mg/m <sup>3</sup>	0.23
PROC4, PROC8b,	TRA Workers		Inhalation: short-term,	<= 2.81 mg/m <sup>3</sup>	<= 0.16

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PROC13	3.0		systemic		
PROC4, PROC8b, PROC13	TRA Workers 3.0		Dermal: long-term, systemic	$\leq 1.37 \text{ mg/kg bw/day}$	$\leq 0.51$
PROC4, PROC8b, PROC13	TRA Workers 3.0		Chronic dermal local exposure	$\leq 0.2 \text{ mg/cm}^2$	$\leq 0.13$
PROC4, PROC8b, PROC13	TRA Workers 3.0		Dermal: acute, local	$\leq 0.2 \text{ mg/cm}^2$	$\leq 0.13$
PROC8a, Liquid mixture, Solid mixture	TRA Workers 3.0	Worker (Professional)	Inhalation: long-term, systemic	$1.23 \text{ mg/m}^3$	0.41
PROC8a	TRA Workers 3.0		Inhalation: short-term, systemic	$4.91 \text{ mg/m}^3$	0.27
PROC8a	TRA Workers 3.0		Dermal: long-term, systemic	$1.37 \text{ mg/kg bw/day}$	0.51
PROC8a	TRA Workers 3.0		Chronic dermal local exposure	$0.1 \text{ mg/cm}^2$	0.06
PROC8a	TRA Workers 3.0		Dermal: acute, local	$0.1 \text{ mg/cm}^2$	0.06
PROC10, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	$1.75 \text{ mg/m}^3$	0.58
PROC10	TRA Workers 3.0		Inhalation: short-term, systemic	$7.01 \text{ mg/m}^3$	0.39
PROC10	TRA Workers 3.0		Dermal: long-term, systemic	$0.55 \text{ mg/kg bw/day}$	0.20
PROC10	TRA Workers 3.0		Chronic dermal local exposure	$0.04 \text{ mg/cm}^2$	0.03
PROC10	TRA Workers 3.0		Dermal: acute, local	$0.04 \text{ mg/cm}^2$	0.03
PROC11, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	$1.2 \text{ mg/m}^3$	0.4
PROC11	TRA Workers 3.0		Inhalation: short-term, systemic	$9.82 \text{ mg/m}^3$	0.55
PROC11	TRA Workers 3.0		Dermal: long-term, systemic	$1.07 \text{ mg/kg bw/day}$	0.40
PROC11	TRA Workers 3.0		Chronic dermal local exposure	$0.05 \text{ mg/cm}^2$	0.03
PROC11	TRA Workers 3.0		Dermal: acute, local	$0.05 \text{ mg/cm}^2$	0.03
PROC19, Liquid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	$1.23 \text{ mg/m}^3$	0.41
PROC19	TRA Workers 3.0		Inhalation: short-term, systemic	$4.91 \text{ mg/m}^3$	0.27
PROC19	TRA Workers 3.0		Dermal: long-term, systemic	$1.41 \text{ mg/kg bw/d}$	0.52
PROC19	TRA Workers 3.0		Chronic dermal local exposure	$0.05 \text{ mg/cm}^2$	0.03
PROC19	TRA Workers 3.0		Dermal: acute, local	$0.05 \text{ mg/cm}^2$	0.03
PROC8b, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	$0.70 \text{ mg/m}^3$	0.23
PROC8b	TRA Workers 3.0		Inhalation: short-term, systemic	$2.81 \text{ mg/m}^3$	0.16
PROC8b	TRA Workers 3.0		Dermal: long-term, systemic	$1.37 \text{ mg/kg bw/day}$	0.51
PROC8b	TRA Workers 3.0		Chronic dermal local exposure	$0.1 \text{ mg/cm}^2$	0.06
PROC8b	TRA Workers 3.0		Dermal: acute, local	$0.1 \text{ mg/cm}^2$	0.06
PROC19, Solid mixture	TRA Workers 3.0	Worker (Industrial)	Inhalation: long-term, systemic	$1.23 \text{ mg/m}^3$	0.41
PROC19	TRA Workers 3.0		Inhalation: short-term, systemic	$4.91 \text{ mg/m}^3$	0.27
PROC19	TRA Workers 3.0		Dermal: long-term, systemic	$1.41 \text{ mg/kg bw/d}$	0.52
PROC19	TRA Workers 3.0		Chronic dermal local exposure	$0.05 \text{ mg/cm}^2$	0.03

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	3.0		exposure		
PROC19	TRA Workers 3.0		Dermal: acute, local	0.05 mg/cm2	0.03

For complete exposure estimation, the values for different routes of exposure and activities may have to be summed up.

assumes operating temperature:  $\leq 40\text{ }^{\circ}\text{C}$

### 4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

EUSES = EUSES version 2.1.1

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## ES 24: Professional outdoor use of detergents and maintenance products (AISE)

### 1. Scenario description

Main User Groups	: <b>SU 22:</b> Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Chemical product category	: <b>PC35:</b> Washing and cleaning products (including solvent based products)
Process categories	: <b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises <b>PROC8a:</b> Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at non-dedicated facilities <b>PROC10:</b> Roller application or brushing <b>PROC11:</b> Non industrial spraying
Environmental Release Categories	: <b>ERC8d:</b> Wide dispersive outdoor use of processing aids in open systems
Further information	: AISE = International Association for Soaps, Detergents and Maintenance Products

### 2.1 Contributing scenario controlling environmental exposure for: ERC8d

Activity	: Out-door use
<b>Product characteristics</b>	
Viscosity, dynamic	: 7.28 mPa.s (at 20 °C)
<b>Amount used</b>	
Daily amount for wide dispersive uses	: 0.55 kg
Remarks	: amount used for the exposure estimation
<b>Frequency and duration of use</b>	
Continuous exposure	: 365 days/year

#### Environment factors not influenced by risk management

Flow rate of receiving surface water	: 18,000 m <sup>3</sup> /d
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#### Other given operational conditions affecting environmental exposure

Emission or Release Factor: Air	: 100 %
Emission or Release Factor: Water	: 100 %
Emission or Release Factor: Soil	: 20.0 %

#### Technical conditions and measures / Organizational measures

Water	: All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.
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#### Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant	: Municipal sewage treatment plant
Flow rate of sewage treatment plant effluent	: 2,000 m <sup>3</sup> /d
Effectiveness (of a measure)	: 87.7 %
Sludge Treatment	: Can be applied on agricultural soil, when in compliance with

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local regulations.

## Conditions and measures related to external treatment of waste for disposal

Disposal methods : Dispose of as hazardous waste in compliance with local and national regulations.

## 2.2 Contributing scenario controlling worker exposure for: PROC4, PROC8a, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Outdoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.3 Contributing scenario controlling worker exposure for: PROC11, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 4 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Outdoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 95 %)  
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness (of a measure): 90 %)

## 2.4 Contributing scenario controlling worker exposure for: PROC4, PROC8a, Solid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Solid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Outdoor use

### Conditions and measures related to personal protection, hygiene and health evaluation

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Wear respiratory protection. (Effectiveness (of a measure): 90 %)

### 3. Exposure estimation and reference to its source

#### Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure (PEC)	RCR
ERC8d	EUSES		Fresh water		0.0005 mg/l	0.02
			Fresh water sediment		0.005 mg/kg dry weight	0.02
			Marine water		0.00005 mg/l	0.02
			Marine sediment		0.0005 mg/kg dry weight	0.02
			Sewage treatment plant		0.003 mg/l	< 0.01
			Soil		0.0005 mg/kg dry weight	0.02

#### Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PROC4, PROC8a, Liquid mixture	TRA Workers 3.0	Worker (Professional)	Inhalation: long-term, systemic	$\leq 1.23 \text{ mg/m}^3$	$\leq 0.27$
PROC4, PROC8a	TRA Workers 3.0		Inhalation: short-term, systemic	$\leq 4.91 \text{ mg/m}^3$	$\leq 0.27$
PROC4, PROC8a	TRA Workers 3.0		Dermal: long-term, systemic	$\leq 1.37 \text{ mg/kg bw/day}$	$\leq 0.51$
PROC4, PROC8a	TRA Workers 3.0		Chronic dermal local exposure	$0.1 \text{ mg/cm}^2$	0.06
PROC4, PROC8a	TRA Workers 3.0		Dermal: acute, local	$0.1 \text{ mg/cm}^2$	0.06
PROC11, Liquid mixture	TRA Workers 3.0	Worker (Professional)	Inhalation: long-term, systemic	$1.47 \text{ mg/m}^3$	0.49
PROC11	TRA Workers 3.0		Inhalation: short-term, systemic	$9.82 \text{ mg/m}^3$	0.55
PROC11	TRA Workers 3.0		Dermal: long-term, systemic	$1.07 \text{ mg/kg bw/day}$	0.40
PROC11	TRA Workers 3.0		Chronic dermal local exposure	$0.05 \text{ mg/cm}^2$	0.03
PROC11	TRA Workers 3.0		Dermal: acute, local	$0.05 \text{ mg/cm}^2$	0.03
PROC4, PROC8a, Solid mixture	TRA Workers 3.0	Worker (Professional)	Inhalation: long-term, systemic	$\leq 1.23 \text{ mg/m}^3$	$\leq 0.41$
PROC4, PROC8a	TRA Workers 3.0		Inhalation: short-term, systemic	$\leq 4.91 \text{ mg/m}^3$	$\leq 0.27$
PROC4, PROC8a	TRA Workers 3.0		Dermal: long-term, systemic	$\leq 1.37 \text{ mg/kg bw/day}$	$\leq 0.51$
PROC4, PROC8a	TRA Workers 3.0		Chronic dermal local exposure	$0.1 \text{ mg/cm}^2$	0.06
PROC4, PROC8a	TRA Workers 3.0		Dermal: acute, local	$0.1 \text{ mg/cm}^2$	0.06

assumes operating temperature:  $\leq 40 \text{ }^\circ\text{C}$

For complete exposure estimation, the values for different routes of exposure and activities may have to be summed up.



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## **4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario**

EUSES = EUSES version 2.1.1

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## ES 25: Professional use Polishes and wax blends (AISE)

### 1. Scenario description

Main User Groups	: <b>SU 22:</b> Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Chemical product category	: <b>PC31:</b> Polishes and wax blends
Process categories	: <b>PROC8a:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities <b>PROC10:</b> Roller application or brushing <b>PROC11:</b> Non industrial spraying
Environmental Release Categories	: <b>ERC8a:</b> Wide dispersive indoor use of processing aids in open systems
Further information	: AISE = International Association for Soaps, Detergents and Maintenance Products

### 2.1 Contributing scenario controlling environmental exposure for: ERC8a

#### Product characteristics

Viscosity, dynamic : 7.28 mPa.s (at 20 °C)

#### Frequency and duration of use

Continuous exposure : 365 days/year

#### Environment factors not influenced by risk management

Flow rate of receiving surface water : 18,000 m<sup>3</sup>/d

#### Other given operational conditions affecting environmental exposure

Emission or Release Factor: Air : 100 %  
Emission or Release Factor: Water : 100 %  
Emission or Release Factor: Soil : 0.0 %

#### Technical conditions and measures / Organizational measures

Water : All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.

#### Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant : Municipal sewage treatment plant  
Flow rate of sewage treatment plant effluent : 2,000 m<sup>3</sup>/d  
Effectiveness (of a measure) : 87.7 %  
Sludge Treatment : Can be applied on agricultural soil, when in compliance with local regulations.

#### Conditions and measures related to external treatment of waste for disposal

Disposal methods : Dispose of as hazardous waste in compliance with local and national regulations.

### 2.2 Contributing scenario controlling worker exposure for: PROC8a, Liquid mixture

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## Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Liquid mixture

## Frequency and duration of use

Frequency of use : <= 8 hours/day

## Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

## Technical conditions and measures

Provide adequate ventilation. (Effectiveness (of a measure): 30 %)

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.3 Contributing scenario controlling worker exposure for: PROC10, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). (Effectiveness (of a measure): 30 %)

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 90 %)

## 2.4 Contributing scenario controlling worker exposure for: PROC11, Liquid mixture

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 1 %.  
Physical Form (at time of use) : Liquid mixture

### Frequency and duration of use

Frequency of use : <= 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

### Technical conditions and measures

Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). (Effectiveness (of a measure): 70 %)

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear respiratory protection. (Effectiveness (of a measure): 95 %)

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Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
(Effectiveness (of a measure): 90 %)

### 3. Exposure estimation and reference to its source

#### Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure (PEC)	RCR
ERC8a	EUSES		Fresh water		0.0005 mg/l	0.02
			Fresh water sediment		0.005 mg/kg dry weight	0.02
			Marine water		0.00005 mg/l	0.02
			Marine sediment		0.0005 mg/kg dry weight	0.02
			Sewage treatment plant		0.003 mg/l	< 0.01
			Soil		0.0005 mg/kg dry weight	0.02

#### Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PROC8a, Liquid mixture	TRA Workers 3.0	Worker (Professional)	Inhalation: long-term, systemic	2.45 mg/m <sup>3</sup>	0.82
PROC8a	TRA Workers 3.0		Inhalation: short-term, systemic	9.82 mg/m <sup>3</sup>	0.55
PROC8a	TRA Workers 3.0		Dermal: long-term, systemic	0.14 mg/kg bw/day	0.05
PROC8a	TRA Workers 3.0		Chronic dermal local exposure	0.02 mg/cm <sup>2</sup>	0.01
PROC8a	TRA Workers 3.0		Dermal: acute, local	0.02 mg/cm <sup>2</sup>	0.01
PROC10, Liquid mixture	TRA Workers 3.0	Worker (Professional)	Inhalation: long-term, systemic	1.75 mg/m <sup>3</sup>	0.58
PROC10	TRA Workers 3.0		Inhalation: short-term, systemic	7.01 mg/m <sup>3</sup>	0.39
PROC10	TRA Workers 3.0		Dermal: long-term, systemic	0.55 mg/kg bw/day	0.20
PROC10	TRA Workers 3.0		Chronic dermal local exposure	0.04 mg/cm <sup>2</sup>	0.03
PROC10	TRA Workers 3.0		Dermal: acute, local	0.04 mg/cm <sup>2</sup>	0.03
PROC11, Liquid mixture	TRA Workers 3.0	Worker (Professional)	Inhalation: long-term, systemic	1.05 mg/m <sup>3</sup>	0.35
PROC11	TRA Workers 3.0		Inhalation: short-term, systemic	4.21 mg/m <sup>3</sup>	0.23
PROC11	TRA Workers 3.0		Dermal: long-term, systemic	1.07 mg/kg bw/day	0.40
PROC11	TRA Workers 3.0		Chronic dermal local exposure	0.05 mg/cm <sup>2</sup>	0.03
PROC11	TRA Workers 3.0		Dermal: acute, local	0.05 mg/cm <sup>2</sup>	0.03

assumes operating temperature: <= 40 °C

For complete exposure estimation, the values for different routes of exposure and activities may have to be summed up.

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## **4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario**

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EUSES = EUSES version 2.1.1

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## **ES 26: Consumer Washing and cleaning products (including solvent based products) (AISE)**

### **1. Scenario description**

Main User Groups	: <b>SU 21:</b> Consumer uses: Private households (= general public = consumers)
Chemical product category	: <b>PC35:</b> Washing and cleaning products (including solvent based products)
Environmental Release Categories	: <b>ERC8d, ERC8a:</b> Wide dispersive outdoor use of processing aids in open systems, Wide dispersive indoor use of processing aids in open systems
Further information	: AISE = International Association for Soaps, Detergents and Maintenance Products

### **2.1 Contributing scenario controlling environmental exposure for: ERC8d**

#### **Product characteristics**

Viscosity, dynamic : 7.28 mPa.s (at 20 °C)

#### **Frequency and duration of use**

Continuous exposure : 365 days/year

#### **Environment factors not influenced by risk management**

Flow rate : 18,000 m<sup>3</sup>/d

#### **Other given operational conditions affecting environmental exposure**

Wide dispersive outdoor use of processing aids in open systems  
Emission or Release Factor: Air : 100 %  
Emission or Release Factor: Water : 100 %  
Emission or Release Factor: Soil : 20 %  
Wide dispersive indoor use of processing aids in open systems  
Emission or Release Factor: Air : 100 %  
Emission or Release Factor: Water : 100 %  
Emission or Release Factor: Soil : 0 %

#### **Conditions and measures related to municipal sewage treatment plant**

Type of Sewage Treatment Plant : Municipal sewage treatment plant  
Flow rate of sewage treatment plant effluent : 2,000 m<sup>3</sup>/d  
Effectiveness (of a measure) : 87.7 %  
Sludge Treatment : Can be applied on agricultural soil, when in compliance with local regulations.

#### **Conditions and measures related to external treatment of waste for disposal**

Disposal methods : Dispose of as hazardous waste in compliance with local and national regulations.

### **2.2 Contributing scenario controlling consumer exposure for: PC35, PC35/1**

Activity : Laundry and dish washing products  
**Product characteristics**  
Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 0.05%.

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Physical Form (at time of use) : Liquid mixture, Solid mixture

### Amount used

Amount per event : 0.05 kg

### Frequency and duration of use

Exposure duration per day : 1 h  
Frequency of use : 365 days/year

## 2.3 Contributing scenario controlling consumer exposure for: PC35, PC35/2

Activity : Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners )

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 0.25%, Automotive care (spray, liquid)  
Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 0.1%, other uses  
Physical Form (at time of use) : Liquid mixture, Solid mixture

### Amount used

Amount per event : 17 g  
Remarks : Surface cleaning  
Amount per event : 80 g  
Remarks : Toilet cleaners (powder, liquid, gel, tablet) for consumer use  
Amount per event : 688 g  
Remarks : Carpet cleaners (spray, liquid) for consumer use, High pressure washers/cleaners  
Amount per event : 1300 g  
Remarks : Automotive care (spray, liquid)

### Frequency and duration of use

Exposure duration per day : 0.33 h  
Frequency of use : 0.33 hours/day  
Remarks : Surface cleaning  
Exposure duration per day : 1 h  
Frequency of use : 1 Events per day  
Remarks : Toilet cleaners (powder, liquid, gel, tablet) for consumer use, Carpet cleaners (spray, liquid) for consumer use, High pressure washers/cleaners, Automotive care (spray, liquid)

## 2.4 Contributing scenario controlling consumer exposure for: PC35, PC35/3

Activity : Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners), Surface cleaning

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 5%, Surface cleaning  
Physical Form (at time of use) : Liquid mixture, Solid mixture

### Amount used

Amount per event : 53 g  
Remarks : Surface cleaning

### Frequency and duration of use

Exposure duration per day : 4 h

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Frequency of use : 1 Events per day  
Remarks : Surface cleaning

### 2.5 Contributing scenario controlling consumer exposure for: PC35, PC35/4

Activity : Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners )

#### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 0.25%., Automotive care (spray, liquid)  
Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 0.1%., Oven cleaners, Carpet cleaners (spray, liquid) for consumer use  
Physical Form (at time of use) : Liquid mixture

#### Amount used

Amount per event : 35 g  
Remarks : Oven cleaners (spray, trigger) for consumer use  
Amount per event : 35 g  
Remarks : Carpet cleaners (spray, liquid) for consumer use  
Amount per event : 35 g  
Remarks : Automotive care (spray, liquid)

#### Frequency and duration of use

Exposure duration per day : 4 h  
Frequency of use : 1 Events per day  
Remarks : Oven cleaners (spray, trigger) for consumer use, Carpet cleaners (spray, liquid) for consumer use, Automotive care (spray, liquid)

### 3. Exposure estimation and reference to its source

#### Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure (PEC)	RCR
ERC8d	EUSES		Fresh water		0.001 mg/l	0.05
			Fresh water sediment		0.01 mg/kg dry weight	0.05
			Marine water		0.0001 mg/l	0.05
			Marine sediment		0.001 mg/kg dry weight	0.05
			Sewage treatment plant		0.01 mg/l	< 0.01
			Soil		0.001 mg/kg dry weight	0.04

#### Consumers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PC35/1	EGRET 2	Consumers	Inhalation: long-term, systemic	0.68 mg/m <sup>3</sup>	0.91



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PC35/1	EGRET 2		Dermal: long-term, systemic	0.06 mg/kg bw/day	0.04
PC35/1	EGRET 2		Chronic dermal local exposure	0 mg/cm2	< 0.01
PC35/1	EGRET 2		Dermal: acute, local	0 mg/cm2	< 0.01
PC35/1	Extended TRA		Oral exposure	0 mg/kg bw/day	< 0.01
PC35/2	EGRET 2	Consumers	Inhalation: long-term, systemic	<= 0.09 mg/m <sup>3</sup>	<= 0.13
PC35/2	EGRET 2		Dermal: long-term, systemic	<= 0.03 mg/kg bw/day	<= 0.02
PC35/2	EGRET 2		Chronic dermal local exposure	<= 0.003 mg/cm2	<= 0.01
PC35/2	EGRET 2		Dermal: acute, local	<= 0.003 mg/cm2	<= 0.01
PC35/2	Extended TRA		Oral exposure	0 mg/kg bw/day	< 0.01
PC35/3	EGRET 2	Consumers	Inhalation: long-term, systemic	0.15 mg/m <sup>3</sup>	0.20
PC35/3	EGRET 2		Dermal: long-term, systemic	0.02 mg/kg bw/day	0.01
PC35/3	EGRET 2		Chronic dermal local exposure	0.0005 mg/cm2	< 0.01
PC35/3	EGRET 2		Dermal: acute, local	0.0005 mg/cm2	< 0.01
PC35/3	Extended TRA		Oral exposure	0 mg/kg bw/day	< 0.01
PC35/4	ConsExpo	Consumers	Inhalation: long-term, systemic	<= 0.66 mg/m <sup>3</sup>	<= 0.89
PC35/4	ConsExpo		Dermal: long-term, systemic	<= 0.01 mg/kg bw/day	< 0.01
PC35/4	ConsExpo		Chronic dermal local exposure	<= 0.003 mg/cm2	< 0.01
PC35/4	ConsExpo		Dermal: acute, local	<= 0.003 mg/cm2	< 0.01
PC35/4	Extended TRA		Oral exposure	0 mg/kg bw/day	< 0.01

For complete exposure estimation, the values for different routes of exposure and activities may have to be summed up.

### 4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

EUSES = EUSES version 2.1.1

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## ES 27: Consumer use of air care products (AISE)

### 1. Scenario description

Main User Groups	: <b>SU 21:</b> Consumer uses: Private households (= general public = consumers)
Chemical product category	: <b>PC3:</b> Air care products
Environmental Release Categories	: <b>ERC8d:</b> Wide dispersive outdoor use of processing aids in open systems
Further information	: AISE = International Association for Soaps, Detergents and Maintenance Products

### 2.1 Contributing scenario controlling environmental exposure for: ERC8d

#### Amount used

Daily amount for wide dispersive uses	: 0.55 kg
Remarks	: amount used for the exposure estimation

#### Frequency and duration of use

Continuous exposure	: 365 days/year
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#### Environment factors not influenced by risk management

Flow rate	: 18,000 m3/d
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#### Other given operational conditions affecting environmental exposure

Wide dispersive outdoor use of processing aids in open systems	
Emission or Release Factor: Air	: 100 %
Emission or Release Factor: Water	: 100 %
Emission or Release Factor: Soil	: 20 %
Wide dispersive indoor use of processing aids in open systems	
Emission or Release Factor: Air	: 100 %
Emission or Release Factor: Water	: 100 %
Emission or Release Factor: Soil	: 0 %

#### Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant	: Municipal sewage treatment plant
Flow rate of sewage treatment plant effluent	: 2,000 m3/d
Effectiveness (of a measure)	: 87.7 %
Sludge Treatment	: Can be applied on agricultural soil, when in compliance with local regulations.

### 2.2 Contributing scenario controlling consumer exposure for: PC8

#### Product characteristics

Concentration of the Substance in Mixture/Article	: Covers percentage substance in the product up to 1 %.
Physical Form (at time of use)	: Liquid mixture, Solid mixture

#### Amount used

Amount per event	: 50 g
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Remarks : Pest control products - electrical evaporator  
Amount per event : 6 g  
Remarks : other uses

### Frequency and duration of use

Exposure duration per day : 8 h  
Remarks : Pest control products - electrical evaporator  
Exposure duration per day : 0.25 h  
Remarks : other uses

## 3. Exposure estimation and reference to its source

### Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure (PEC)	RCR
ERC8d	EUSES		Fresh water		0.0005 mg/l	0.02
			Fresh water sediment		0.005 mg/kg dry weight	0.02
			Marine water		0.00005 mg/l	0.02
			Marine sediment		0.0005 mg/kg dry weight	0.02
			Sewage treatment plant		0.003 mg/l	< 0.01
			Soil		0.0005 mg/kg dry weight	0.02

### Consumers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PC8	ConsExpo	Consumers	Inhalation: long-term, systemic	$\leq 0.03 \text{ mg/m}^3$	$\leq 0.03$
	ConsExpo		Dermal: long-term, systemic	$\leq 1.0 \text{ mg/kg bw/day}$	$\leq 0.71$
	ConsExpo		Chronic dermal local exposure	$\leq 0.02 \text{ mg/cm}^2$	$\leq 0.02$
	ConsExpo		Dermal: acute, local	$\leq 0.02 \text{ mg/kg bw/day}$	$\leq 0.02$
	Extended TRA		Oral exposure	$0 \text{ mg/cm}^2$	< 0.01

For complete exposure estimation, the values for different routes of exposure and activities may have to be summed up.

## 4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

EUSES = EUSES version 2.1.1

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## ES 28: Biocides (AISE)

### 1. Scenario description

Main User Groups	: <b>SU 21:</b> Consumer uses: Private households (= general public = consumers)
Chemical product category	: <b>PC8:</b> Biocidal products (e.g. Disinfectants, pest control)
Environmental Release Categories	: <b>ERC8d, ERC8a:</b> Wide dispersive outdoor use of processing aids in open systems, Wide dispersive indoor use of processing aids in open systems
Further information	: AISE = International Association for Soaps, Detergents and Maintenance Products

### 2.1 Contributing scenario controlling environmental exposure for: ERC8d

#### Amount used

Daily amount for wide dispersive uses	: 0.55 kg
Remarks	: amount used for the exposure estimation

#### Frequency and duration of use

Continuous exposure	: 365 days/year
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#### Environment factors not influenced by risk management

Flow rate	: 18,000 m <sup>3</sup> /d
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#### Other given operational conditions affecting environmental exposure

Wide dispersive outdoor use of processing aids in open systems	
Emission or Release Factor: Air	: 100 %
Emission or Release Factor: Water	: 100 %
Emission or Release Factor: Soil	: 20 %
Wide dispersive indoor use of processing aids in open systems	
Emission or Release Factor: Air	: 100 %
Emission or Release Factor: Water	: 100 %
Emission or Release Factor: Soil	: 0 %

#### Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant	: Municipal sewage treatment plant
Flow rate of sewage treatment plant effluent	: 2,000 m <sup>3</sup> /d
Effectiveness (of a measure)	: 87.7 %
Sludge Treatment	: Can be applied on agricultural soil, when in compliance with local regulations.

### 2.2 Contributing scenario controlling consumer exposure for: PC8

#### Product characteristics

Concentration of the Substance in Mixture/Article	: Covers percentage substance in the product up to 1 %.
Physical Form (at time of use)	: Liquid mixture, Solid mixture

#### Amount used

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Amount per event : 50 g  
Remarks : Pest control products - electrical evaporator  
Amount per event : 6 g  
Remarks : other uses

### Frequency and duration of use

Exposure duration per day : 8 h  
Remarks : Pest control products - electrical evaporator  
Exposure duration per day : 0.25 h  
Remarks : other uses

## 3. Exposure estimation and reference to its source

### Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure (PEC)	RCR
ERC8d	EUSES		Fresh water		0.0005 mg/l	0.02
			Fresh water sediment		0.005 mg/kg dry weight	0.02
			Marine water		0.00005 mg/l	0.02
			Marine sediment		0.0005 mg/kg dry weight	0.02
			Sewage treatment plant		0.003 mg/l	< 0.01
			Soil		0.0005 mg/kg dry weight	0.02

### Consumers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PC8	ConsExpo	Consumers	Inhalation: long-term, systemic	$\leq 0.03 \text{ mg/m}^3$	$\leq 0.03$
	ConsExpo		Dermal: long-term, systemic	$\leq 1.0 \text{ mg/kg bw/day}$	$\leq 0.71$
	ConsExpo		Chronic dermal local exposure	$\leq 0.02 \text{ mg/cm}^2$	$\leq 0.02$
	ConsExpo		Dermal: acute, local	$\leq 0.02 \text{ mg/kg bw/day}$	$\leq 0.02$
	Extended TRA		Oral exposure	$0 \text{ mg/cm}^2$	< 0.01

For complete exposure estimation, the values for different routes of exposure and activities may have to be summed up.

## 4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

EUSES = EUSES version 2.1.1

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## ES 29: Polishes and wax blends (AISE)

### 1. Scenario description

Main User Groups	: <b>SU 21:</b> Consumer uses: Private households (= general public = consumers)
Chemical product category	: <b>PC31:</b> Polishes and wax blends
Environmental Release Categories	: <b>ERC8a:</b> Wide dispersive indoor use of processing aids in open systems
Further information	: AISE = International Association for Soaps, Detergents and Maintenance Products

### 2.1 Contributing scenario controlling environmental exposure for: ERC8a

#### Product characteristics

Viscosity, dynamic	: 7.28 mPa.s (at 20 °C)
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#### Frequency and duration of use

Continuous exposure	: 365 days/year
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#### Environment factors not influenced by risk management

Flow rate	: 18,000 m <sup>3</sup> /d
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#### Other given operational conditions affecting environmental exposure

Emission or Release Factor: Air	: 100 %
Emission or Release Factor: Water	: 100 %
Emission or Release Factor: Soil	: 0.0 %

#### Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant	: Municipal sewage treatment plant
Flow rate of sewage treatment plant effluent	: 2,000 m <sup>3</sup> /d
Effectiveness (of a measure)	: 87.7 %
Sludge Treatment	: Can be applied on agricultural soil, when in compliance with local regulations.

#### Conditions and measures related to external treatment of waste for disposal

Disposal methods	: Dispose of as hazardous waste in compliance with local and national regulations.
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### 2.2 Contributing scenario controlling consumer exposure for: PC31

#### Product characteristics

Concentration of the Substance in Mixture/Article	: Covers the percentage of the substance in the product up to 0.1%, Manual spray application - indoor
Concentration of the Substance in Mixture/Article	: Covers the percentage of the substance in the product up to 5%, other uses
Physical Form (at time of use)	: Liquid mixture, Solid mixture

#### Amount used

Amount per event	: 135 g
Remarks	: Manual spray application (liquid products)
Amount per event	: 550 g
Remarks	: other uses

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### Frequency and duration of use

Duration of the activity : 4 h

## 3. Exposure estimation and reference to its source

### Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure (PEC)	RCR
ERC8a	EUSES		Fresh water		0.0005 mg/l	0.02
			Fresh water sediment		0.005 mg/kg dry weight	0.02
			Marine water		0.00005 mg/l	0.02
			Marine sediment		0.0005 mg/kg dry weight	0.02
			Sewage treatment plant		0.003 mg/l	< 0.01
			Soil		0.0005 mg/kg dry weight	0.02

### Consumers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PC31	ConsExpo, AISE REACT	Consumers	Inhalation: long-term, systemic	$\leq 0.24 \text{ mg/m}^3$	$\leq 0.33$
	ConsExpo		Dermal: long-term, systemic	$\leq 0.15 \text{ mg/kg bw/day}$	$\leq 0.11$
	ConsExpo		Chronic dermal local exposure	$\leq 0.006 \text{ mg/cm}^2$	< 0.01
	ConsExpo		Dermal: acute, local	$\leq 0.006 \text{ mg/cm}^2$	< 0.01
	Extended TRA		Oral exposure	0 mg/kg bw/day	< 0.01

For complete exposure estimation, the values for different routes of exposure and activities may have to be summed up.

## 4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

EUSES = EUSES version 2.1.1

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## ES 30: Consumer use of cosmetics

### 1. Scenario description

Main User Groups : **SU 21:** Consumer uses: Private households (= general public = consumers)  
Chemical product category : **PC39:** Cosmetics, personal care products  
Environmental Release Categories : **ERC8a:** Wide dispersive indoor use of processing aids in open systems

### 2.1 Contributing scenario controlling environmental exposure for: ERC8a

#### Product characteristics

Viscosity, dynamic : 7.28 mPa.s (at 20 °C)

#### Frequency and duration of use

Continuous exposure : 365 days/year

#### Environment factors not influenced by risk management

Flow rate : 18,000 m<sup>3</sup>/d

#### Other given operational conditions affecting environmental exposure

Emission or Release Factor: Air : 100 %  
Emission or Release Factor: Water : 100 %  
Emission or Release Factor: Soil : 0.0 %

#### Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant : Municipal sewage treatment plant  
Flow rate of sewage treatment plant effluent : 2,000 m<sup>3</sup>/d  
Effectiveness (of a measure) : 87.7 %  
Sludge Treatment : Can be applied on agricultural soil, when in compliance with local regulations.

#### Conditions and measures related to external treatment of waste for disposal

Disposal methods : Dispose of as hazardous waste in compliance with local and national regulations.

### 2.2 Contributing scenario controlling consumer exposure for: PC39

#### Product characteristics

Physical Form (at time of use) : Liquid mixture, Solid mixture

## 3. Exposure estimation and reference to its source

### Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure (PEC)	RCR
ERC8a	EUSES		Fresh water		0.0005 mg/l	0.02
			Fresh water sediment		0.005 mg/kg dry weight	0.02



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			Marine water		0.00005 mg/l	0.02
			Marine sediment		0.0005 mg/kg dry weight	0.02
			Sewage treatment plant		0.003 mg/l	< 0.01
			Soil		0.0005 mg/kg dry weight	0.02

Risk to consumers' health does not need to be assessed as this is already covered by the Cosmetic Directive 76/768/EEC.

#### 4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

EUSES = EUSES version 2.1.1

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