AUGEO® CLEAN MULTI

Revision Date 06.12.2023

The United Kingdom (UK) has left the European Union (EU) officially on 31/01/2020, however the classification and labelling regime is still based on the existing EU regulatory regime during a transition period to provide continuity for businesses. Therefore this document is still aligned on EU standards to ensure the safe use of the substance. It will be updated as the UK publishes new classification and labelling regulation diverging from the legal framework currently applied.

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

1.1 Product identifier

- Trade name: AUGEO® CLEAN MULTI
- Chemical name: Racemic mixture (+/-)-2,2-dimethyl-4-hydroxymethyl-1,3-dioxolane
- CAS-No.: 100-79-8

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

Uses of the Substance/Mixture

- Cleaning agent
- Waxes
- Stain removers and waxes removers
- Glass cleaner
- diluent and vehicle for fragrances

Remarks

- For professional and industrial installation and use only.

1.3 Details of the supplier of the safety data sheet

Company

Craftovator Ltd
Fleetwood House
1 Albion Close
Slough
SL2 5DT

E-mail address

info@craftovator.co.uk

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (Regulation (EC) No 1272/2008)

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

2.2 Label elements

GB Harmonized System of Classification and Labelling of Chemicals (GB CLP)

Pictogram

Signal word
- Warning

Hazard statements
- H319 Causes serious eye irritation.

Precautionary statements

Prevention
- P264 Wash skin thoroughly after handling.
- P280 Wear eye protection/ face protection.

Response
- P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P337 + P313 If eye irritation persists: Get medical advice/ attention.

2.3 Other hazards which do not result in classification

None known.

SECTION 3: Composition/information on ingredients

3.1 Substance

- Chemical name: Racemic mixture (+/-)-2,2-dimethyl-4-hydroxymethyl-1,3-dioxolane
- Synonyms: (+/-)-2,2-dimethyl-1,3-dioxolane-4-methanol, Isopropylidene glycerol
- Formula: C6H12O3

Information on Components and Impurities

Chemical name	Identification number	Classification Regulation (EC) No 1272/2008	Concentration [%]
2,2-dimethyl-1,3-dioxolan-4-ylmethanol	CAS-No. : 100-79-8 EINECS-No. : 202-888-7	Eye irritation, Category 2 ; H319	>= 99 - <= 100

For the full text of the H-Statements mentioned in this Section, see Section 16.

3.2 Mixture

- Not applicable, this product is a substance.

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice

- First aider needs to protect himself.
- Show this safety data sheet to the doctor in attendance.
- Place affected clothing in a sealed bag for subsequent decontamination.
- When symptoms persist or in all cases of doubt seek medical advice.

In case of inhalation

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- Quickly move the person away from the contaminated area. Make the affected person rest.
- Obtain medical attention.
- Show this sheet to the doctor.
- Be prepared to provide first aid or medical support if necessary.

In case of skin contact

- Wash off immediately with plenty of water for at least 15 minutes.
- Use appropriate protective equipment when treating a contaminated person.
- In case of inflammation (redness, irritation, ...) obtain medical attention.
- Show this sheet to the doctor.
- Be prepared to provide first aid or medical support if necessary.

In case of eye contact

- Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
- Keep eye wide open while rinsing.
- Show this sheet to the doctor.
- Always obtain medical advice, even if there are no symptoms.
- Be prepared to provide first aid or medical support if necessary.

In case of ingestion

- Do NOT induce vomiting.
- Obtain medical attention.
- Show this sheet to the doctor.
- Do not give anything to drink.
- Be prepared to provide first aid or medical support if necessary.

4.2 Most important symptoms and effects, both acute and delayed

Effects

- Chronic exposure may cause dermatitis.
- May cause irreversible eye damage.
- Loss of the eye

Symptoms

- Redness
- Swelling of tissue
- Causes skin burns.
- Lachrymation
- Conjunctivitis
- Causes eye burns.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician

- Burns must be treated by a physician.
- Contact a poison control center.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

- Extinguishing media - small fires
- Water spray
- Multi-purpose powders
- Carbon dioxide (CO2)
- Alcohol Resistant Aqueous Film Forming Foam (AR-AFFF)

- Extinguishing media - large fires
- Water spray
- Multi-purpose powders

- Alcohol Resistant Aqueous Film Forming Foam (AR-AFFF)

- Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Unsuitable extinguishing media

- Do not use a solid water stream as it may scatter and spread fire.

- High volume water jet

5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting

- Combustible liquid.

- The pressure in sealed containers can increase under the influence of heat.

- Hazardous decomposition products formed under fire conditions.
- High concentrations of toxic or harmful products may remain in the residual liquid once the fire has been extinguished.

- Under fire conditions:
- Will burn
- On combustion, toxic gases are released.

Hazardous combustion products:

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

5.3 Advice for firefighters

Special protective equipment for firefighters

- Wear full protective clothing and self-contained breathing apparatus.
- Personal protective equipment comprising: suitable protective gloves, safety goggles and protective clothing
- In the event of fire, wear self-contained breathing apparatus.
- For further information refer to section 8 "Exposure controls/personal protection".

Specific fire fighting methods

- Stay upwind.

- Fight fire with normal precautions from a reasonable distance.

- Do not use a solid water stream as it may scatter and spread fire.
- Cool down the containers/equipment exposed to heat with a water spray. Ensure that there is NO direct contact between the water and the product.
- Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

- Cool containers/tanks with water spray.
- Do not use a solid water stream as it may scatter and spread fire.

Further information

- Evacuate personnel to safe areas.

- Intervention only by capable personnel who are trained and aware of the hazards of the product.
- Never approach containers which have been exposed to fire, without cooling them sufficiently.

- Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
- Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

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SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

- Avoid inhalation, ingestion and contact with skin and eyes.
- Wear chemical resistant personal protective equipment
- Wear suitable gloves.
- Wear suitable protective clothing.

- Wear as appropriate:
- Face-shield
- Tightly fitting safety goggles

- In the case of dust or aerosol formation use respirator with an approved filter.
- In the case of vapour formation use a respirator with an approved filter.

- Eliminate all ignition sources if safe to do so.

- Stop leak if safe to do so.

- For further information refer to section 8 "Exposure controls/personal protection".

6.2 Environmental precautions

- Take all necessary measures to avoid accidental discharge of products into drains and waterways due to the rupture of containers or transfer systems.

- Prevent further leakage or spillage if safe to do so.
- Contain the spilled material by bunding.
- The product should not be allowed to enter drains, water courses or the soil.

6.3 Methods and materials for containment and cleaning up

- No sparking tools should be used.

- Stop leak if safe to do so.
- Dam up with sand or inert earth (do not use combustible materials).

- Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder).
- Shovel or sweep up.
- Keep in suitable, closed containers for disposal.
- Never return spills in original containers for re-use.

- Wash non-recoverable remainder with large amounts of water.
- Clean contaminated surface thoroughly.
- Recover the cleaning water for subsequent disposal.
- Decontaminate tools, equipment and personal protective equipment in a segregated area.

- Dispose of in accordance with local regulations.

6.4 Reference to other sections

- 7. HANDLING AND STORAGE
- 8. EXPOSURE CONTROLS/PERSONAL PROTECTION
- 13. DISPOSAL CONSIDERATIONS

SECTION 7: Handling and storage

7.1 Precautions for safe handling

- Handle in accordance with good industrial hygiene and safety practice.

- Wear personal protective equipment.

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- Wear suitable protective clothing.

- Avoid inhalation, ingestion and contact with skin and eyes.

- Avoid splashes.
- Avoid formation of aerosol.

- For personal protection see section 8.

- Containers must be bonded and grounded when pouring or transferring material.
- This material contains a flammable or combustible liquid and vapor.

Hygiene measures

- Handle in accordance with good industrial hygiene and safety practice.
- Use clean, well-maintained personal protection equipment.
- Regular cleaning of equipment, work area and clothing.
- When using do not eat, drink or smoke.
- Smoking, eating and drinking should be prohibited in the application area.
- Wash hands before breaks and immediately after handling the product.
- Contaminated work clothing should not be allowed out of the workplace.

- The user is responsible for monitoring the working environment in accordance with local laws and regulations.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/Storage conditions

- Take all necessary measures to avoid accidental discharge of products into drains and waterways due to the rupture of containers or transfer systems.

- Keep locked up or in an area accessible only to qualified or authorised persons.

- Keep containers tightly closed in a dry, cool and well-ventilated place.
- Keep away from open flames, hot surfaces and sources of ignition.
- Keep away from incompatible materials to be indicated by the manufacturer

- Observe the general rules of industrial fire protection.
- Areas containing this material should have fire safe practices and electrical equipment in accordance with applicable regulations and/or guidelines. Standards are primarily based on the material`s flashpoint, but may also take into account properties such as miscibility with water or toxicity. All local and national regulations should be followed. In the Americas, National Fire Protection Association (NFPA) 30: Flammable and Combustible Liquids Code, is a widely used standard. NFPA 30 establishes storage conditions for the following classes of materials: Class I Flammable Liquids, Flashpoint <37.8 °C. Class II Combustible Liquids, 37.8 °C < Flashpoint <60 °C. Class IIIa Combustible Liquids, 60 °C < Flashpoint < 93 °C. Class IIIb Combustible Liquids, Flashpoint > 93 °C.
- Keep away from sources of ignition - No smoking.

Packaging material

Suitable material
- Unlined steel
- Plastic container of HDPE

7.3 Specific end use(s)

- no data available

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

- Contains no substances with occupational exposure limit values above their regulatory reporting threshold.

8.2 Exposure controls

Control measures

Engineering measures

- Effective exhaust ventilation system
- Ensure adequate ventilation.

- Extract at emission point.
- Ensure that extracted air cannot be returned to the workplace through the ventilation system.

- Avoid splashes.
- Avoid formation of aerosol.

Individual protection measures

Respiratory protection

- This should be achieved by a good general extraction and -if practically feasible- by the use of a local exhaust ventilation.
- Use a respirator with an approved filter if a risk assessment indicates this is necessary.
- Keep in a well-ventilated place.

Hand protection

- Where there is a risk of contact with hands, use appropriate gloves
- Gloves must be inspected prior to use.
- Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time.
- Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

- The selected protective gloves have to satisfy the specifications of Regulation (EU) 2016/425 and the standard EN 374 derived from it.

- Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact).
- Impervious gloves

Eye protection

- Tightly fitting safety goggles
- Face-shield

- Chemical resistant goggles must be worn.
- Tightly fitting safety goggles

Skin and body protection

- Full protective suit
- Footwear protecting against chemicals

- Choose body protection according to the amount and concentration of the dangerous substance at the work place.

- Impervious clothing
- Change working clothes after each workshift.
- Contaminated work clothing should not be allowed out of the workplace.

Hygiene measures

- Handle in accordance with good industrial hygiene and safety practice.
- Use clean, well-maintained personal protection equipment.
- Regular cleaning of equipment, work area and clothing.
- When using do not eat, drink or smoke.
- Smoking, eating and drinking should be prohibited in the application area.
- Wash hands before breaks and immediately after handling the product.
- Contaminated work clothing should not be allowed out of the workplace.

- The user is responsible for monitoring the working environment in accordance with local laws and regulations.

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Protective measures

- Emergency equipment immediately accessible, with instructions for use.
- Ensure that eyewash stations and safety showers are close to the workstation location.
- Selection of appropriate personal protective equipment should be based on an evaluation of the performance characteristics of the protective equipment relative to the task(s) to be performed, conditions present, duration of use, and the potential hazards and/or risks that may occur during use.

- The protective equipment must be selected in accordance with current CEN standards and in cooperation with the supplier of the protective equipment.

Environmental exposure controls

- Dam up.
- Prevent product from entering sewage system.
- Try to prevent the material from entering drains or water courses.
- Local authorities should be advised if significant spillages cannot be contained.

- Take all necessary measures to avoid accidental discharge of products into drains and waterways due to the rupture of containers or transfer systems.

- Prevent further leakage or spillage if safe to do so.
- Contain the spilled material by bunding.
- The product should not be allowed to enter drains, water courses or the soil.

- Dispose of rinse water in accordance with local and national regulations.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	liquid
Colour	colourless
Odour	slight
Odour Threshold	No data available
Melting point/freezing point	Freezing point: -99 °C
Initial boiling point and boiling range	Boiling point/boiling range: 183 - 191 °C (1,013.25 hPa)
Flammability (solid, gas)	No data available
Flammability (liquids)	No data available
Flammability/Explosive limit	No data available
Flash point	91 °C closed cup 100 °C open cup
Auto-ignition temperature	No data available
Decomposition temperature	No data available
pH	Not applicable
Viscosity	Viscosity, dynamic : 11 mPa.s (20 °C)
Solubility	Water solubility: (20 °C)completely soluble

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Solubility in other solvents:
Alcohol: miscible

Esters: miscible

Ether: miscible

Aromatic hydrocarbons: miscible

petroleum ether.: miscible

petrol: miscible

Partition coefficient: n-octanol/water	No data available
Vapour pressure	0.05 hPa (20 °C)
Density	1.0670 g/cm3 (20 °C)
Relative density	1.069 (20 °C)
Relative vapor density	2.6
Particle characteristics	No data available
Evaporation rate (Butylacetate = 1)	0.027

9.2 Other information

Self-ignition	390 °C (1,013 hPa) Method: EU Test Guideline A15
Surface tension	33.5 mN/m (20 °C)
Molecular weight	132.16 g/mol

SECTION 10: Stability and reactivity

10.1 Reactivity

- Stable at normal ambient temperature and pressure.

10.2 Chemical stability

- Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

- No dangerous reaction known under conditions of normal use.

10.4 Conditions to avoid

- Keep away from open flames, hot surfaces and sources of ignition.

- Avoid high temperatures.
- Avoid excessive heat for prolonged periods of time.

10.5 Incompatible materials

- Strong oxidizing agents
- Strong acids
- On contact with acid releases:
- Acetone

10.6 Hazardous decomposition products

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- On combustion or on thermal decomposition (pyrolysis) releases:
- Carbon monoxide, carbon dioxide and unburned hydrocarbons (smoke).

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Acute oral toxicity

2,2-dimethyl-1,3-dioxolan-4-ylmethanol	LD50 : 7,000 mg/kg - Rat Not classified as hazardous for acute oral toxicity according to GHS. Published data

Acute inhalation toxicity

2,2-dimethyl-1,3-dioxolan-4-ylmethanol	LC50 - 4 h (aerosol) : > 5.11 mg/l - Rat , male and female Method: OECD Test Guideline 403 Not classified as hazardous for acute inhalation toxicity according to GHS. No mortality observed at this concentration. Unpublished reports

Acute dermal toxicity

2,2-dimethyl-1,3-dioxolan-4-ylmethanol	LD50 : 2,000 mg/kg - Rat , male and female Method: OECD Test Guideline 402 Not classified as hazardous for acute dermal toxicity according to GHS. Semiocclusive No mortality observed at this dose. Unpublished reports

Acute toxicity (other routes of administration)	No data available

Skin corrosion/irritation

2,2-dimethyl-1,3-dioxolan-4-ylmethanol	Rabbit No skin irritation Method: OECD Test Guideline 404 Semiocclusive Unpublished reports

Serious eye damage/eye irritation

2,2-dimethyl-1,3-dioxolan-4-ylmethanol	Rabbit Causes serious eye irritation. Method: OECD Test Guideline 405 Unpublished reports

Respiratory or skin sensitisation

2,2-dimethyl-1,3-dioxolan-4-ylmethanol	Maximisation Test - Guinea pig Responding animals in GPMT < 30% Method: OECD Test Guideline 406 Unpublished reports

Mutagenicity

Genotoxicity in vitro

2,2-dimethyl-1,3-dioxolan-4-ylmethanol	Ames test with and without metabolic activation negative Method: OECD Test Guideline 471 Unpublished reports

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	Gene mutation assays in mammalian cells. Strain: mouse lymphoma cells with and without metabolic activation negative Method: OECD Test Guideline 490 Unpublished reports
Genotoxicity in vivo	
2,2-dimethyl-1,3-dioxolan-4-ylmethanol	In vivo micronucleus test - Mouse male Intraperitoneal route Method: OECD Test Guideline 474 negative Unpublished reports
Carcinogenicity	No data available

Toxicity for reproduction and development

Toxicity to reproduction/Fertility	
2,2-dimethyl-1,3-dioxolan-4-ylmethanol	Reproduction/developmental toxicity screening test - Rat, male and female, Oral General Toxicity - Parent NOAEL: 1,000 mg/kg bw/day Fertility NOEL: 1,000 mg/kg bw/day General Toxicity F1 NOEL: 1,000 mg/kg bw/day OECD Test Guideline 422 Gavage, Highest dose tested, no impairment of fertility has been observed, Unpublished reports One-Generation Reproduction Toxicity Study - Rat, male and female, Oral General Toxicity - Parent NOAEL: 1,000 mg/kg bw/day Fertility NOAEL Parent: 1,000 mg/kg bw/day General Toxicity F1 NOAEL: 1,000 mg/kg bw/day Fertility NOAEL F1: 1,000 mg/kg bw/day Developmental Toxicity NOAEL F1: 1,000 mg/kg bw/day General Toxicity F2 NOAEL: 1,000 mg/kg bw/day Developmental Toxicity NOAEL F2: 1,000 mg/kg bw/day OECD Test Guideline 443 Gavage, Highest dose tested, no impairment of fertility has been observed, Unpublished internal reports
Developmental Toxicity/Teratogenicity	
2,2-dimethyl-1,3-dioxolan-4-ylmethanol	Pre-natal - Rat, male and female, Oral

General Toxicity Maternal NOAEL: 1,000 mg/kg bw/day

Developmental Toxicity NOAEL F1: 1,000 mg/kg bw/day

Method: OECD Test Guideline 414
Gavage, Highest dose tested, no teratogenic effects have been observed,
Unpublished reports

Pre-natal - Rabbit, female, Oral

General Toxicity Maternal NOAEL: 300 mg/kg bw/day

Developmental Toxicity NOAEL F1: 1,000 mg/kg bw/day

Method: OECD Test Guideline 414
Gavage, Highest dose tested, no teratogenic effects have been observed,
Unpublished internal reports

STOT

STOT - single exposure

2,2-dimethyl-1,3-dioxolan-4-ylmethanol: The substance or mixture is not classified as specific target organ toxicant, single exposure according to GHS criteria.
internal evaluation

STOT - repeated exposure

2,2-dimethyl-1,3-dioxolan-4-ylmethanol: The substance or mixture is not classified as specific target organ toxicant, repeated exposure according to GHS criteria.
internal evaluation

2,2-dimethyl-1,3-dioxolan-4-ylmethanol: Oral 5 Weeks - Rat , male and female
NOAEL: 1000 mg/kg
Method: OECD Test Guideline 422
Gavage
Highest dose tested
No systemic toxicity observed.
Unpublished reports

Inhalation (aerosol) 90-day - Rat , male and female
NOAEC: > 5 mg/l
Method: OECD Test Guideline 413
Highest dose tested
No significant adverse effects were reported
Unpublished reports

Experience with human exposure: No data available

Aspiration toxicity: No data available

SECTION 12: Ecological information

12.1 Toxicity

Aquatic Compartment

Acute toxicity to fish

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2,2-dimethyl-1,3-dioxolan-4-ylmethanol	LC50 - 96 h : 16,700 mg/l - Pimephales promelas (fathead minnow) flow-through test Analytical monitoring: yes Method: according to a standardised method Not harmful to fish (LC/LL50 > 100 mg/L) Published data

Acute toxicity to daphnia and other aquatic invertebrates

2,2-dimethyl-1,3-dioxolan-4-ylmethanol	EC50 - 48 h : > 96 mg/l - Daphnia magna (Water flea) static test Analytical monitoring: yes Method: OECD Test Guideline 202 Not harmful to aquatic invertebrates. (EC/EL50 > 100 mg/L) Highest concentration tested Unpublished reports EC50 - 48 h : 4,600 mg/l - Daphnia magna (Water flea) static test Analytical monitoring: yes Method: OECD Test Guideline 202 Not harmful to aquatic invertebrates. (EC/EL50 > 100 mg/L) Unpublished reports

Toxicity to aquatic plants

2,2-dimethyl-1,3-dioxolan-4-ylmethanol	ErC50 - 72 h : > 92 mg/l - Pseudokirchneriella subcapitata (green algae) static test Analytical monitoring: yes End point: Growth rate Method: OECD Test Guideline 201 Not harmful to algae (EC/EL50 > 100 mg/L) Highest concentration tested Unpublished reports NOEC - 72 h : 92 mg/l - Pseudokirchneriella subcapitata (green algae) static test Analytical monitoring: yes End point: Growth rate Method: OECD Test Guideline 201 No adverse chronic effect observed up to and including the threshold of 1 mg/L. Highest concentration tested Unpublished reports ErC50 - 72 h : 15,000 mg/l - Raphidocelis subcapitata (freshwater green alga) static test End point: Growth rate Method: OECD Test Guideline 201 Not harmful to algae (EC/EL50 > 100 mg/L) Unpublished reports NOEC - 72 h : 940 mg/l - Raphidocelis subcapitata (freshwater green alga) static test End point: Growth rate Method: OECD Test Guideline 201 No adverse chronic effect observed up to and including the threshold of 1 mg/L. Unpublished reports

Toxicity to microorganisms

2,2-dimethyl-1,3-dioxolan-4-ylmethanol	- 3 h : - activated sludge static test End point: Respiration inhibition

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EC50 : > 1,000 mg/l

EC10 : > 1,000 mg/l

Analytical monitoring: no
Method: OECD Test Guideline 209
Unpublished reports

Chronic toxicity to fish No data available

Chronic toxicity to daphnia and other aquatic invertebrates

2,2-dimethyl-1,3-dioxolan-4-ylmethanol

NOEC: 10 mg/l - 21 Days - Daphnia magna (Water flea)
semi-static test
Analytical monitoring: yes
End point: Reproduction
Method: OECD Test Guideline 211
No adverse chronic effect observed up to and including the threshold of 1 mg/L.
Unpublished reports

Terrestrial Compartment

Toxicity to soil dwelling organisms

2,2-dimethyl-1,3-dioxolan-4-ylmethanol

NOEC: 250 mg/kg - 56 Days - Eisenia fetida (earthworms)
End point: Reproduction
Method: OECD Test Guideline 222
Unpublished reports

EC10: 1,250 mg/kg - 28 Days - soil micro-organisms
End point: Nitrogen transformation
Method: OECD Test Guideline 216
Unpublished reports

12.2 Persistence and degradability

Abiotic degradation

Stability in water

2,2-dimethyl-1,3-dioxolan-4-ylmethanol

DT50:
Hydrolysis
pH: 4.0

Temperature of hydrolysis: 15 °C
Hydrolysis time: 6.59 Days

Temperature of hydrolysis: 20 °C
Hydrolysis time: 3.51 Days

Temperature of hydrolysis: 25 °C
Hydrolysis time: 0.959 Days

Method: OECD Test Guideline 111
Unpublished reports

Physical- and photo-chemical elimination No data available

Biodegradation

Biodegradability

2,2-dimethyl-1,3-dioxolan-4-ylmethanol

Ready biodegradability study:
Method: OECD Test Guideline 301 D
4 % - 28 Days
The substance does not fulfill the criteria for ready biodegradability and ultimate

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aerobic biodegradability
Theoretical oxygen demand
Inoculum: activated sludge
Unpublished reports

Inherent biodegradability study
Method: OECD Test Guideline 302 B
25 % - 28 Days
The substance fulfills the criteria for inherent primary biodegradability
Dissolved organic carbon (DOC)
Inoculum: activated sludge
Unpublished internal reports

Degradability assessment

2,2-dimethyl-1,3-dioxolan-4-ylmethanol	The product is not considered to be rapidly degradable in the environment

12.3 Bioaccumulative potential

Partition coefficient: n-octanol/water

2,2-dimethyl-1,3-dioxolan-4-ylmethanol	Due to the distribution coefficient n-octanol/water, accumulation in organisms is not expected.

Bioconcentration factor (BCF)	No data available

12.4 Mobility in soil

Adsorption potential (Koc)

2,2-dimethyl-1,3-dioxolan-4-ylmethanol	Adsorption/Soil Log Koc: < 1.25 Method: OECD Test Guideline 121 Highly mobile in soils Unpublished reports

Known distribution to environmental compartments	No data available

12.5 Results of PBT and vPvB assessment

2,2-dimethyl-1,3-dioxolan-4-ylmethanol	This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

12.6 Other adverse effects

Ecotoxicity assessment

Short-term (acute) aquatic hazard

2,2-dimethyl-1,3-dioxolan-4-ylmethanol	Not harmful to aquatic life (LC/LL50, EC/EL50 > 100 mg/L)

Long-term (chronic) aquatic hazard

2,2-dimethyl-1,3-dioxolan-4-ylmethanol	No adverse chronic effect observed up to and including the threshold of 1 mg/L.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product Disposal

Prohibition

- Do not discharge directly into the environment.
- Dispose of in accordance with local regulations.
- The Company encourages the recycle, recovery and reuse of materials, where permitted. If disposal is necessary,

The Company recommends that organic materials, especially when classified as hazardous waste, be disposed of by thermal treatment or incineration at approved facilities. All local and national regulations should be followed.

Advice on cleaning and disposal of packaging

Prohibition

- Do NOT dispose of untreated packaging with industrial waste.
- Do not dispose of with domestic refuse.

- Empty remaining contents.

- Clean using steam.
- Monitor the residual vapours.
- Dispose of rinse water in accordance with local and national regulations.

- Containers that cannot be cleaned must be treated as waste.

- Dispose of contents/ container to an approved waste disposal plant.
- Dispose of in accordance with local regulations.

- Where possible recycling is preferred to disposal or incineration.
- The recycled material must be completely dry and free of pollutants.

SECTION 14: Transport information

ADN/ADNR
not regulated

ADR
not regulated

RID
not regulated

IMDG
not regulated

IATA
not regulated

Note: The above regulatory prescriptions are those valid on the date of publication of this sheet. Given the possible evolution of transport regulations for hazardous materials, it would be advisable to check their validity with your sales office.

SECTION 15: Regulatory information

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

Notification status

Inventory Information	Status
United States TSCA Inventory	- All substances listed as active on the TSCA inventory
Canadian Domestic Substances List (DSL)	- Listed on Inventory
Australian Inventory of Industrial Chemicals (AIIC)	- Listed on Inventory
Japan. CSCL - Inventory of Existing and New Chemical Substances	- Listed on Inventory
Korea. Korean Existing Chemicals Inventory (KECI)	- Listed on Inventory

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China. Inventory of Existing Chemical Substances in China (IECSC)	- Listed on Inventory
Philippines Inventory of Chemicals and Chemical Substances (PICCS)	- Listed on Inventory
Taiwan Chemical Substance Inventory (TCSI)	- Listed on Inventory
New Zealand. Inventory of Chemical Substances	- All components are listed on the NZIoC inventory. Additional HSNO obligations may apply. Please refer to Section 15 of SDS for New Zealand.
EU. European Registration, Evaluation, Authorization and Restriction of Chemical (REACH)	- When purchased from a Solvay legal entity based in the EEA (""European" "Economic Area""), this product is compliant with the registration" provisions of the REACH Regulation (EC) No. 1907/2006 as all its components are either excluded, exempt, and/or registered. When purchased from a legal entity outside of the EEA, please contact your local representative for additional information.
Korea. Act on Registration and Evaluation of Chemicals	- When purchased from a Solvay legal entity based in Korea, this product is compliant with "Act on Registration and Evaluation of Chemicals" (AREC or K-REACH, Article 10) as all its components are either excluded, exempt, and/or (pre)registered. When purchased from a legal entity outside of Korea, please contact your local representative for additional information.

15.2 Chemical safety assessment

- no data available

SECTION 16: Other information

Full text of H-Statements referred to under sections 2 and 3.

- H319: Causes serious eye irritation.

Key or legend to abbreviations and acronyms used in the safety data sheet

- ADR: European Agreement on International Carriage of Dangerous Goods by Road.
- ADN: European Agreement on the International Carriage of Dangerous Goods by Inland Waterways.
- RID: European Agreement concerning the International Carriage of Dangerous Goods by Rail.
- IATA: International Air Transport Association.
- ICAO-TI: Technical Instructions for Safe Transport of Dangerous Goods by Air.
- IMDG: International Maritime Dangerous Goods.
- TWA: Time weighted average
- ATE: Estimated value of acute toxicity
- EC: European Community number
- CAS: Chemical Abstracts Service.
- LD50: Substance that causes 50% (half) death in the test animals group (Median Fatal Dose).
- LC50: Substance concentration causing 50% (half) death in the test animals group.
- EC50: Effective Concentration of the substance causing the maximum of 50%.
- PBT: Persistent, Bioaccumulative and Toxic substance.
- vPvB: Very Persistent and Very Bioaccumulative.
- GHS/CLP/SEA: Classification, labeling, packaging regulation

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- DNEL: Derived No Effect Level
- PNEC: Predicted No Effect Concentration
- STOT: Specific Target Organ Toxicity

Not all acronyms listed above are referenced in this SDS.

Further information

- Distribute new edition to clients
- Update
- See section 2

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. Such information is only given as a guidance to help the user handle, use, process, store, transport, dispose and release the product in satisfactory safety conditions and is not to be considered as a warranty or quality specification. It should be used in conjunction with technical sheets but do not replace them. Thus, the information only relates to the designated specific product and may not be applicable if such product is used in combination with other materials or in any other manufacturing process, unless otherwise specifically indicated. It does not release the user from ensuring he is in conformity with all regulations linked to its activity.

Annex
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ES1: Consumer use, Use into insect repellent products

1.1. Title section

Structured Short Title	:	Consumer use

Environment		
CS1	**End use of insect repellent products**	ERC8a,
Consumer		
CS2	**Use of biocidal products (insect repellent), Electric room diffuser, Indoor**	PC8,,, OC8
CS3	**Use of biocidal products (insect repellent), Electric diffuser, Outdoor**	PC8,,, OC9

1.2. Conditions of use affecting exposure

1.2.1. Control of environmental exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a) / End use of insect repellent products ()

Amount used, frequency and duration of use (or from service life)		
EU tonnage (T/year)	:	60
Fraction of EU tonnage used in region:	:	10 %
Annual amount per site	:	0.012 t
Daily amount per site	:	<= 0.033 kg
Emission Days (days/year):	:	365
Maximum daily local emission to waste water	:	0.033 kg
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	No specific measures identified.

1.2.2. Control of consumer exposure: Biocidal products (e.g. Disinfectants, pest control) (PC8) / Use of biocidal products (insect repellent) () / Electric room diffuser () / Indoor (OC8)

Conditions and measures related to personal protection, hygiene and health evaluation
General measures (eye irritants)
Avoid direct eye contact with product, also via contamination on hands.
Avoid splashing.
Other conditions affecting consumers exposure

Indoor or outdoor use	:	Indoor use

1.2.3. Control of consumer exposure: Biocidal products (e.g. Disinfectants, pest control) (PC8) / Use of biocidal products (insect repellent) () / Electric diffuser () / Outdoor (OC9)

Conditions and measures related to personal protection, hygiene and health evaluation
General measures (eye irritants)
Avoid direct eye contact with product, also via contamination on hands.
Avoid splashing.
Other conditions affecting consumers exposure
Indoor or outdoor use : Outdoor use

1.3. Exposure estimation and reference to its source

1.3.1. Environmental release and exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a) / End use of insect repellent products ()

Compartment	Exposure level	RCR
Freshwater	0.0034 mg/L (EUSES v2.1)	0.017
Freshwater sediment	0.018 mg/kg dry weight (EUSES v2.1)	0.015
Marine water	0.000252 mg/L (EUSES v2.1)	< 0.01
Marine sediment	0.00136 mg/kg dry weight (EUSES v2.1)	0.011
Sewage treatment plant	0.016 mg/L (EUSES v2.1)	< 0.01
Agricultural soil	0.00942 mg/kg dry weight (EUSES v2.1)	< 0.01
Man via environment - Inhalation	0.0000795 mg/m³ (EUSES v2.1)	< 0.01
Man via environment - Oral	0.000873 mg/kg bw/day (EUSES v2.1)	< 0.01
Man via environment - combined routes		< 0.01

1.3.2. Consumer exposure: Biocidal products (e.g. Disinfectants, pest control) (PC8) / Use of biocidal products (insect repellent) () / Electric room diffuser () / Indoor (OC8)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.057 mg/m³ (AISE REACT)	< 0.01
dermal	systemic	long-term	0 mg/kg bw/day (AISE REACT)	< 0.01
combined routes	systemic	long-term		< 0.01

1.3.3. Consumer exposure: Biocidal products (e.g. Disinfectants, pest control) (PC8) / Use of biocidal products (insect repellent) () / Electric diffuser () / Outdoor (OC9)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.057 mg/m³ (AISE REACT)	< 0.01
dermal	systemic	long-term	0 mg/kg bw/day (AISE REACT)	< 0.01

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combined routes	systemic	long-term		< 0.01

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

Environment
If a DU has OC/RMMs outside specifications in the ES, then the DU can evaluate whether he works inside the boundaries set by the ES through scaling in EUSES.
The main driving parameters are :
- local amount used (tonnage)
- release factor prior to on-site treatment
- on-site wastewater treatment presence and efficiency
- dilution factor

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Human Health
Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

ES2: Consumer use, Use in paint

2.1. Title section

Structured Short Title	:	Consumer use

Environment		
CS1	**Consumer use**	ERC8a,
Consumer		
CS2	**All application phases regarding water borne paint**	PC9a,
CS3	**All application phases regarding coatings**	PC9a,

2.2. Conditions of use affecting exposure

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

Amount used, frequency and duration of use (or from service life)		
Daily amount per site	:	<= 0.088 kg
Maximum daily local emission to waste water	:	0.088 kg
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	Particular considerations on the waste treatment operations

2.2.2. Control of consumer exposure: Coatings and paints, thinners, paint removers (PC9a) / All application phases regarding water borne paint ()

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Amount used, frequency and duration of use (or from service life)		
Amount per Application	:	<= 3750 g/event
Exposure frequency	:	1 events/day
Use frequency	:	Infrequent
Duration	:	Application duration <= 120 min
Duration	:	Dermal exposure duration per event <= 120 min
Duration	:	Inhalation exposure duration per event <= 132 min
Other conditions affecting consumers exposure		
Room size	:	>= 20 m3

Ventilation rate	:	>= 0.6

2.2.3. Control of consumer exposure: Coatings and paints, thinners, paint removers (PC9a) / All application phases regarding coatings ()

Product (article) characteristics		
Covers concentrations up to 4 %		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Amount per Application	:	<= 1650 g/event
Exposure frequency	:	1 events/day
Use frequency	:	Infrequent
Duration	:	Application duration <= 60 min
Duration	:	Inhalation exposure duration per event <= 60 min
Other conditions affecting consumers exposure		
Room size	:	>= 34 m3
Ventilation rate	:	>= 1.5

2.3. Exposure estimation and reference to its source

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

Compartment	Exposure level	RCR
Freshwater	0.00608 mg/L (EUSES v2.1)	0.03
Freshwater sediment	0.033 mg/kg dry weight (EUSES v2.1)	0.028
Marine water	0.000526 mg/L (EUSES v2.1)	< 0.01
Marine sediment	0.00283 mg/kg dry weight (EUSES v2.1)	0.024
Sewage treatment plant	0.044 mg/L (EUSES v2.1)	< 0.01
Agricultural soil	0.00967 mg/kg dry weight (EUSES v2.1)	< 0.01
Man via environment - Inhalation	0.0000795 mg/m³ (EUSES v2.1)	< 0.01
Man via environment - Oral	0.00089 mg/kg bw/day (EUSES v2.1)	< 0.01
Man via environment - combined routes		< 0.01

2.3.2. Consumer exposure: Coatings and paints, thinners, paint removers (PC9a) / All application phases regarding water borne paint ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR

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dermal	systemic	long-term	0.0033 mg/kg bw/day (ConsExpo web 1.1.0)	< 0.01
inhalative	systemic	long-term	0.0053 mg/m³ (ConsExpo web 1.1.0)	< 0.01
combined routes	systemic	long-term		< 0.01

2.3.3. Consumer exposure: Coatings and paints, thinners, paint removers (PC9a) / All application phases regarding coatings ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
dermal	systemic	long-term	0.000154 mg/kg bw/day (ConsExpo web 1.1.0)	< 0.01
inhalative	systemic	long-term	0.009 mg/m³ (ConsExpo web 1.1.0)	< 0.01
combined routes	systemic	long-term		< 0.01

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

Environment
If a DU has OC/RMMs outside specifications in the ES, then the DU can evaluate whether he works inside the boundaries set by the ES through scaling in EUSES.
The main driving parameters are :
- local amount used (tonnage)
- release factor prior to on-site treatment
- on-site wastewater treatment presence and efficiency
- dilution factor

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Human Health
Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

ES3: Formulation or re-packing, Industrial formulation of homecare products

3.1. Title section

Structured Short Title	:	Formulation or re-packing

Environment		
CS1	**Industrial formulation of homecare products**	ERC2,
Worker		
CS2	**General process exposures, no sampling**	PROC1,, CS57
CS3	**General process exposures, With sample collection**	PROC2,, CS56
CS4	**General process exposures**	PROC3,
CS5	**General exposures open batch process including aerosols**	PROC4,
CS6	**Batch processes at elevated temperatures (e.g. solvents resin manufacture, grease manufacture)**	PROC3,
CS7	**Sample collection**	PROC3,
CS8	**Laboratory activities**	PROC15, CS36
CS9	**Bulk transfers, Drum/batch transfers**	PROC8b, CS14, CS8
CS10	**Mixing operations (open systems)**	PROC5, CS30
CS11	**Transfer from/pouring from containers, Manual**	PROC8a, CS22, CS34
CS12	**Tabletting, compression, extrusion or pelletisation**	PROC14
CS13	**Drum and small package filling**	PROC9, CS6
CS14	**Clean down and Maintenance**	PROC8a,
CS15	**Storage**	PROC1,
CS16	**Storage**	PROC2,

3.2. Conditions of use affecting exposure

3.2.1. Control of environmental exposure: Formulation into mixture (ERC2) / Industrial formulation of homecare products ()

Amount used, frequency and duration of use (or from service life)		
Annual amount per site	:	<= 1269 t
Daily amount per site	:	<= 12.69 t
Maximum daily local emission to waste water	:	1.269 kg
Maximum daily local emission to air	:	317.2 kg
Conditions and measures related to sewage treatment plant		

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STP type	:	Biological Sewage Treatment Plant
STP sludge treatment	:	Sewage sludge may be recovered for agricultural or horticultural purposes
STP effluent	:	2,000 m3/d
STP Water - minimum efficiency of 0.255 %		
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	Particular considerations on the waste treatment operations
Other conditions affecting environmental exposure		
Receiving surface water flow	:	18,000 m3/d

3.2.2. Control of worker exposure: Use in closed process, no likelihood of exposure (PROC1) / General process exposures () / no sampling (CS57)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity <= 1 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands.		
Avoid splashing.		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
without local exhaust ventilation		
Use in closed process, no likelihood of exposure		
Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

3.2.3. Control of worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / General process exposures () / with sample collection (CS56)

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Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity <= 1 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands.		
Avoid splashing.		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
without local exhaust ventilation		
Closed continuous process with occasional controlled exposure		
Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity <= 1 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands.		
Avoid splashing.		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
without local exhaust ventilation		
Closed batch process with occasional controlled exposure		

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Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

3.2.5. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4) / General exposures open batch process including aerosols ()

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity <= 1 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands.		
Avoid splashing.		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Local exhaust ventilation Inhalation - minimum efficiency of >= 90 %		
Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
Use suitable eye protection.		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

3.2.6. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Batch processes at elevated temperatures (e.g. solvents resin manufacture, grease manufacture) ()

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity <= 1 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands.		
Avoid splashing.		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Local exhaust ventilation Inhalation - minimum efficiency of >= 90 %		
Closed batch process with occasional controlled exposure		
Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity <= 15 min/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands.		
Avoid splashing.		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
without local exhaust ventilation		
Closed batch process with occasional controlled exposure		
Occupational Health and Safety Management System: Advanced.		

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Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

3.2.8. Control of worker exposure: Use as laboratory reagent (PROC15) / Laboratory activities (CS36)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity <= 1 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands.		
Avoid splashing.		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Local exhaust ventilation Inhalation - minimum efficiency of >= 90 %		
Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

3.2.9. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Bulk transfers (CS14) / Drum/batch transfers (CS8)

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

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Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity <= 1 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands.		
Avoid splashing.		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Local exhaust ventilation Inhalation - minimum efficiency of >= 95 %		
Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
Use suitable eye protection.		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

3.2.10. Control of worker exposure: Mixing or blending in batch processes (PROC5) / Mixing operations (open systems) (CS30)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid Aerosol
Amount used, frequency and duration of use (or from service life)		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands.		
Avoid splashing.		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Local exhaust ventilation Inhalation - minimum efficiency of >= 90 %		
Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
Use suitable eye protection.		

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Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %
For further specification, refer to section 8 of the SDS.
Other conditions affecting workers exposure
Indoor or outdoor use : Indoor use
Temperature : Assumes process temperature up to 40 °C

3.2.11. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer from/pouring from containers (CS22) / Manual (CS34)

Product (article) characteristics
Covers percentage substance in the product up to 100 %.
Physical form of product : Liquid
Amount used, frequency and duration of use (or from service life)
Use frequency : Duration of the activity <= 1 h/day
Technical and organisational conditions and measures
Avoid direct eye contact with product, also via contamination on hands.
Avoid splashing.
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Local exhaust ventilation Inhalation - minimum efficiency of >= 90 %
Occupational Health and Safety Management System: Advanced.
Conditions and measures related to personal protection, hygiene and health evaluation
General measures (eye irritants)
Use suitable eye protection.
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %
For further specification, refer to section 8 of the SDS.
Other conditions affecting workers exposure
Indoor or outdoor use : Indoor use
Temperature : Assumes process temperature up to 40 °C

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

Product (article) characteristics
Covers percentage substance in the product up to 100 %.
Physical form of product : Liquid
Amount used, frequency and duration of use (or from service life)

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Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands.		
Avoid splashing.		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Local exhaust ventilation Inhalation - minimum efficiency of >= 90 %		
Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

3.2.13. Control of worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Drum and small package filling (CS6)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands.		
Avoid splashing.		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Local exhaust ventilation Inhalation - minimum efficiency of >= 90 %		
Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		

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Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

3.2.14. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Clean down and Maintenance ()

Product (article) characteristics		
Covers concentrations up to 3 %		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity <= 4 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands.		
Avoid splashing.		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
without local exhaust ventilation		
Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
Use suitable eye protection.		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity <= 15 min/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands.		

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Avoid splashing.
Use in closed process, no likelihood of exposure
Occupational Health and Safety Management System: Advanced.
Conditions and measures related to personal protection, hygiene and health evaluation
General measures (eye irritants)
For further specification, refer to section 8 of the SDS.
Other conditions affecting workers exposure

Indoor or outdoor use	:	Outdoor use
Temperature	:	Assumes process temperature up to 40 °C

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

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

Physical form of product	:	Liquid

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

Use frequency	:	Duration of the activity <= 15 min/day

Technical and organisational conditions and measures
Avoid direct eye contact with product, also via contamination on hands.
Avoid splashing.
Closed continuous process with occasional controlled exposure
Occupational Health and Safety Management System: Advanced.
Conditions and measures related to personal protection, hygiene and health evaluation
General measures (eye irritants)
For further specification, refer to section 8 of the SDS.
Other conditions affecting workers exposure

Indoor or outdoor use	:	Outdoor use
Temperature	:	Assumes process temperature up to 40 °C

3.3. Exposure estimation and reference to its source

3.3.1. Environmental release and exposure: Formulation into mixture (ERC2) / Industrial formulation of homecare products ()

Compartment	Exposure level	RCR
Freshwater	0.065 mg/L (EUSES v2.1)	0.324

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Freshwater sediment	0.348 mg/kg dry weight (EUSES v2.1)	0.295
Marine water	0.00641 mg/L (EUSES v2.1)	0.032
Marine sediment	0.034 mg/kg dry weight (EUSES v2.1)	0.291
Sewage treatment plant	0.633 mg/L (EUSES v2.1)	0.063
Agricultural soil	0.03 mg/kg dry weight (EUSES v2.1)	0.012
Man via environment - Inhalation	0.024 mg/m³ (EUSES v2.1)	< 0.01
Man via environment - Oral	0.058 mg/kg bw/day (EUSES v2.1)	0.012
Man via environment - combined routes		0.013

3.3.2. Worker exposure: Use in closed process, no likelihood of exposure (PROC1) / General process exposures () / no sampling (CS57)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.011 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	0.034 mg/kg bw/day (ECETOC TRA worker v3)	< 0.01
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		< 0.01

3.3.3. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / General process exposures () / with sample collection (CS56)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	1.101 mg/m³ (ECETOC TRA worker v3)	0.018
dermal	systemic	long-term	0.274 mg/kg bw/day (ECETOC TRA worker v3)	0.027
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		0.046

3.3.4. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / General process exposures ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	3.304 mg/m³ (ECETOC TRA worker v3)	0.055

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dermal	systemic	long-term	0.138 mg/kg bw/day (ECETOC TRA worker v3)	0.014
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		0.069

3.3.5. Worker exposure: Chemical production where opportunity for exposure arises (PROC4) / General exposures open batch process including aerosols ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.551 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	1.372 mg/kg bw/day (ECETOC TRA worker v3)	0.137
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		0.146

3.3.6. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Batch processes at elevated temperatures (e.g. solvents resin manufacture, grease manufacture) ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.33 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	0.69 mg/kg bw/day (ECETOC TRA worker v3)	0.069
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		0.075

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	1.652 mg/m³ (ECETOC TRA worker v3)	0.028
dermal	systemic	long-term	0.138 mg/kg bw/day (ECETOC TRA worker v3)	0.014
dermal	local	long-term	(Risk management measures are based	

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			on qualitative risk characterisation.)	
combined routes	systemic	long-term		0.041

3.3.8. Worker exposure: Use as laboratory reagent (PROC15) / Laboratory activities (CS36)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.551 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	0.068 mg/kg bw/day (ECETOC TRA worker v3)	< 0.01
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		0.016

3.3.9. Worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Bulk transfers (CS14) / Drum/batch transfers (CS8)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.275 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	2.742 mg/kg bw/day (ECETOC TRA worker v3)	0.274
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		0.279

3.3.10. Worker exposure: Mixing or blending in batch processes (PROC5) / Mixing operations (open systems) (CS30)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	2.753 mg/m³ (ECETOC TRA worker v3)	0.046
dermal	systemic	long-term	2.742 mg/kg bw/day (ECETOC TRA worker v3)	0.274
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		0.32

3.3.11. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer from/pouring from containers (CS22) / Manual (CS34)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR

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inhalative	systemic	long-term	1.101 mg/m³ (ECETOC TRA worker v3)	0.018
dermal	systemic	long-term	2.742 mg/kg bw/day (ECETOC TRA worker v3)	0.274
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		0.293

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	2.753 mg/m³ (ECETOC TRA worker v3)	0.046
dermal	systemic	long-term	0.686 mg/kg bw/day (ECETOC TRA worker v3)	0.069
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		0.114

3.3.13. Worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Drum and small package filling (CS6)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	2.753 mg/m³ (ECETOC TRA worker v3)	0.046
dermal	systemic	long-term	1.372 mg/kg bw/day (ECETOC TRA worker v3)	0.137
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		0.183

3.3.14. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Clean down and Maintenance ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	6.608 mg/m³ (ECETOC TRA worker v3)	0.11
dermal	systemic	long-term	0.548 mg/kg bw/day (ECETOC TRA worker v3)	0.055
dermal	local	long-term	(Risk management	

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			measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		0.165

3.3.15. Worker exposure: Use in closed process, no likelihood of exposure (PROC1) / Storage ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.00385 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	0.034 mg/kg bw/day (ECETOC TRA worker v3)	< 0.01
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		< 0.01

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.385 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	1.37 mg/kg bw/day (ECETOC TRA worker v3)	0.137
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		0.143

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

Environment
If a DU has OC/RMMs outside specifications in the ES, then the DU can evaluate whether he works inside the boundaries set by the ES through scaling in EUSES.
The main driving parameters are :
- local amount used (tonnage)
- release factor prior to on-site treatment
- on-site wastewater treatment presence and efficiency
- dilution factor

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Human Health
Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

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ES4: Widespread use by professional workers, Professional uses as polishes and wax blends

4.1. Title section

Structured Short Title	:	Widespread use by professional workers

Environment		
CS1	**Polishes and wax blends**	ERC8a, PC31
Worker		
CS2	**Floor care products; polish/impregnating agent**	PROC10,
CS3	**Floor care products; polish/impregnating agent**	PROC11,
CS4	**Maintenance products; furniture and leather care products**	PROC10,
CS5	**Maintenance products; furniture and leather care products**	PROC11,
CS6	**Maintenance products; leather care product/ Preparatory phase**	PROC8a,
CS7	**Maintenance products; leather care product/ Use phase**	PROC2,
CS8	**Maintenance products; drain unblocker**	PROC8a,
CS9	**Maintenance products; stainless steel care**	PROC10,
CS10	**Maintenance products; stainless steel care; spray and wipe**	PROC11,

4.2. Conditions of use affecting exposure

4.2.1. Control of environmental exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a) / Polishes and wax blends (PC31)

Amount used, frequency and duration of use (or from service life)		
Fraction of EU tonnage used in region:	:	10 %
Daily amount per site	:	<= 0.15 kg
Maximum daily local emission to waste water	:	0.15 kg
Conditions and measures related to sewage treatment plant		
STP type	:	Biological Sewage Treatment Plant
STP Water - minimum efficiency of 0.255 %		
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	No specific measures identified.

4.2.2. Control of worker exposure: Roller application or brushing (PROC10) / Floor care products; polish/impregnating agent ()

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Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands.		
Avoid splashing.		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
without local exhaust ventilation		
Occupational Health and Safety Management System: Basic.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
Use suitable eye protection.		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

4.2.3. Control of worker exposure: Non-industrial spraying (PROC11) / Floor care products; polish/impregnating agent ()

Product (article) characteristics		
Covers concentrations up to 3 %		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity <= 15 min/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands.		
Avoid splashing.		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
without local exhaust ventilation		
Occupational Health and Safety Management System: Basic.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
For further specification, refer to section 8 of the SDS.		

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

4.2.4. Control of worker exposure: Roller application or brushing (PROC10) / Maintenance products; furniture and leather care products ()

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity <= 4 hours/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands.		
Avoid splashing.		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
without local exhaust ventilation		
Occupational Health and Safety Management System: Basic.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
Use suitable eye protection.		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

4.2.5. Control of worker exposure: Non-industrial spraying (PROC11) / Maintenance products; furniture and leather care products ()

Product (article) characteristics		
Covers concentrations up to 4 %		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity <= 15 min/day
Technical and organisational conditions and measures		

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Avoid direct eye contact with product, also via contamination on hands.
Avoid splashing.
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
without local exhaust ventilation
Occupational Health and Safety Management System: Basic.
Conditions and measures related to personal protection, hygiene and health evaluation
General measures (eye irritants)
For further specification, refer to section 8 of the SDS.
Other conditions affecting workers exposure

Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

4.2.6. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Maintenance products; leather care product/ Preparatory phase ()

Product (article) characteristics
Covers percentage substance in the product up to 1 %.

Physical form of product	:	Liquid

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

Use frequency	:	Duration of the activity <= 15 min/day

Technical and organisational conditions and measures
Avoid direct eye contact with product, also via contamination on hands.
Avoid splashing.
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
without local exhaust ventilation
Occupational Health and Safety Management System: Basic.
Conditions and measures related to personal protection, hygiene and health evaluation
General measures (eye irritants)
Use suitable eye protection.
For further specification, refer to section 8 of the SDS.
Other conditions affecting workers exposure

Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

4.2.7. Control of worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Maintenance products; leather care product/ Use phase ()

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Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity <= 15 min/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands.		
Avoid splashing.		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
without local exhaust ventilation		
Closed continuous process with occasional controlled exposure		
Occupational Health and Safety Management System: Basic.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity <= 15 min/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands.		
Avoid splashing.		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
without local exhaust ventilation		
Occupational Health and Safety Management System: Basic.		
Conditions and measures related to personal protection, hygiene and health evaluation		

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General measures (eye irritants)
Use suitable eye protection.
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %
Wear suitable respiratory protection. Inhalation - minimum efficiency of >= 90 %
For further specification, refer to section 8 of the SDS.

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

4.2.9. Control of worker exposure: Roller application or brushing (PROC10) / Maintenance products; stainless steel care ()

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity <= 4 hours/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands.		
Avoid splashing.		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
without local exhaust ventilation		
Occupational Health and Safety Management System: Basic.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
Use suitable eye protection.		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

4.2.10. Control of worker exposure: Non-industrial spraying (PROC11) / Maintenance products; stainless steel care; spray and wipe ()

Product (article) characteristics		
Covers concentrations up to 4 %		
Physical form of product	:	Liquid

Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity <= 15 min/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands.		
Avoid splashing.		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
without local exhaust ventilation		
Occupational Health and Safety Management System: Basic.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

4.3. Exposure estimation and reference to its source

4.3.1. Environmental release and exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a) / Polishes and wax blends (PC31)

Compartment	Exposure level	RCR
Freshwater	0.00897 mg/L (EUSES v2.1)	0.045
Freshwater sediment	0.048 mg/kg dry weight (EUSES v2.1)	0.041
Marine water	0.000825 mg/L (EUSES v2.1)	< 0.01
Marine sediment	0.00444 mg/kg dry weight (EUSES v2.1)	0.037
Sewage treatment plant	0.075 mg/L (EUSES v2.1)	< 0.01
Agricultural soil	0.00952 mg/kg dry weight (EUSES v2.1)	< 0.01
Man via environment - Inhalation	0.0000758 mg/m³ (EUSES v2.1)	< 0.01
Man via environment - Oral	0.00087 mg/kg bw/day (EUSES v2.1)	< 0.01
Man via environment - combined routes		< 0.01

4.3.2. Worker exposure: Roller application or brushing (PROC10) / Floor care products; polish/impregnating agent ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	13.76 mg/m³ (ECETOC TRA worker v3)	0.229

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dermal	systemic	long-term	2.743 mg/kg bw/day (ECETOC TRA worker v3)	0.274
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		0.504

4.3.3. Worker exposure: Non-industrial spraying (PROC11) / Floor care products; polish/impregnating agent ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	11.01 mg/m³ (ECETOC TRA worker v3)	0.184
dermal	systemic	long-term	0.22 mg/kg bw/day (RISKOFDERM v2.1)	0.022
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		0.206

4.3.4. Worker exposure: Roller application or brushing (PROC10) / Maintenance products; furniture and leather care products ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	8.26 mg/m³ (ECETOC TRA worker v3)	0.138
dermal	systemic	long-term	2.743 mg/kg bw/day (ECETOC TRA worker v3)	0.274
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		0.412

4.3.5. Worker exposure: Non-industrial spraying (PROC11) / Maintenance products; furniture and leather care products ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	11.01 mg/m³ (ECETOC TRA worker v3)	0.184
dermal	systemic	long-term	0.631 mg/kg bw/day (RISKOFDERM v2.1)	0.063
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		0.247

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4.3.6. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Maintenance products; leather care product/ Preparatory phase ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	1.377 mg/m³ (ECETOC TRA worker v3)	0.023
dermal	systemic	long-term	1.371 mg/kg bw/day (ECETOC TRA worker v3)	0.137
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		0.16

4.3.7. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Maintenance products; leather care product/ Use phase ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.275 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	0.137 mg/kg bw/day (ECETOC TRA worker v3)	0.014
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		0.018

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.138 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	0.274 mg/kg bw/day (ECETOC TRA worker v3)	0.027
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		0.03

4.3.9. Worker exposure: Roller application or brushing (PROC10) / Maintenance products; stainless steel care ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	8.26 mg/m³ (ECETOC TRA worker v3)	0.138

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dermal	systemic	long-term	2.743 mg/kg bw/day (ECETOC TRA worker v3)	0.274
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		0.412

4.3.10. Worker exposure: Non-industrial spraying (PROC11) / Maintenance products; stainless steel care; spray and wipe ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	11.01 mg/m³ (ECETOC TRA worker v3)	0.184
dermal	systemic	long-term	0.631 mg/kg bw/day (RISKOFDERM v2.1)	0.063
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		0.247

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

Environment
If a DU has OC/RMMs outside specifications in the ES, then the DU can evaluate whether he works inside the boundaries set by the ES through scaling in EUSES.
The main driving parameters are :
- local amount used (tonnage)
- release factor prior to on-site treatment
- on-site wastewater treatment presence and efficiency
- dilution factor

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Human Health
Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

ES5: Widespread use by professional workers, Professional end-use of washing and cleaning products (IFRA GES 4)

5.1. Title section

Structured Short Title	:	Widespread use by professional workers

Environment		
CS1	**End-use of washing and cleaning products**	ERC8d, ERC8a,
Worker		
CS2	**Kitchen cleaners (Use phase)**	PROC10,

5.2. Conditions of use affecting exposure

5.2.1. Control of environmental exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) (ERC8d) / Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a) / End-use of washing and cleaning products ()

Amount used, frequency and duration of use (or from service life)		
Fraction of EU tonnage used in region:	:	10 %
Daily amount per site	:	<= 0.198 kg
Maximum daily local emission to waste water	:	0.198 kg
Conditions and measures related to sewage treatment plant		
STP type	:	Biological Sewage Treatment Plant
STP Water - minimum efficiency of 0.255 %		
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	No specific measures identified.

5.2.2. Control of worker exposure: Roller application or brushing (PROC10) / Kitchen cleaners (Use phase) ()

Product (article) characteristics		
Covers concentrations up to 3 %		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Scale of application for spreading of liquid to surface	:	> 3 m2/h
Use frequency	:	Duration of the activity <= 4 hours/day

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Technical and organisational conditions and measures
Avoid direct eye contact with product, also via contamination on hands.
Avoid splashing.
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
without local exhaust ventilation
Occupational Health and Safety Management System: Basic.
Conditions and measures related to personal protection, hygiene and health evaluation
General measures (eye irritants)
Use suitable eye protection.
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %
For further specification, refer to section 8 of the SDS.
Other conditions affecting workers exposure

Indoor or outdoor use	:	Indoor use
Room size	:	Any size workroom
Temperature	:	Assumes process temperature up to 25 °C

5.3. Exposure estimation and reference to its source

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

Compartment	Exposure level	RCR
Freshwater	0.011 mg/L (EUSES v2.1)	0.057
Freshwater sediment	0.061 mg/kg dry weight (EUSES v2.1)	0.052
Marine water	0.00107 mg/L (EUSES v2.1)	< 0.01
Marine sediment	0.00573 mg/kg dry weight (EUSES v2.1)	0.048
Sewage treatment plant	0.099 mg/L (EUSES v2.1)	< 0.01
Agricultural soil	0.00974 mg/kg dry weight (EUSES v2.1)	< 0.01
Man via environment - Inhalation	0.0000759 mg/m³ (EUSES v2.1)	< 0.01
Man via environment - Oral	0.000885 mg/kg bw/day (EUSES v2.1)	< 0.01
Man via environment - combined routes		< 0.01

5.3.2. Worker exposure: Roller application or brushing (PROC10) / Kitchen cleaners (Use phase) ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	3.5 mg/m³ (ART v1.5)	0.058

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dermal	systemic	long-term	1.097 mg/kg bw/day (ECETOC TRA worker v3)	0.11
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		0.168

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

Environment
If a DU has OC/RMMs outside specifications in the ES, then the DU can evaluate whether he works inside the boundaries set by the ES through scaling in EUSES.
The main driving parameters are :
- local amount used (tonnage)
- release factor prior to on-site treatment
- on-site wastewater treatment presence and efficiency
- dilution factor
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Human Health
Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

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ES6: Consumer use, Consumers end-use of washing and cleaning products (IFRA GES 6)

6.1. Title section

Structured Short Title	:	Consumer use

Environment		
CS1	**End-use of washing and cleaning products**	ERC8d, ERC8a,
Consumer		
CS2	**Laundry and dish washing products**	PC35, PC8_1, PC35_1
CS3	**Surface cleaners (liquid)**	PC35,
CS4	**Toilet cleaners (liquid)**	PC35,
CS5	**Carpet cleaning (liquids)**	PC35,
CS6	**Wipes**	PC35,
CS7	**High pressure washers/cleaners**	PC35, AISE-SP-C0021
CS8	**Automotive Care Products**	PC35, PC6
CS9	**Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)**	PC35, PC8_3, PC35_3
CS10	**Surface care, trigger sprays**	PC35,
CS11	**Kitchen cleaner, Liquids**	PC35,, PC24_1
CS12	**Kitchen cleaner, Sprays**	PC35,, PC24_3

6.2. Conditions of use affecting exposure

6.2.1. Control of environmental exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) (ERC8d) / Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a) / End-use of washing and cleaning products ()

Amount used, frequency and duration of use (or from service life)		
Fraction of EU tonnage used in region:	:	10 %
Daily amount per site	:	<= 0.118 kg
Maximum daily local emission to waste water	:	0.118 kg
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	No specific measures identified.

6.2.2. Control of consumer exposure: Washing and cleaning products (PC35) / Laundry and dish washing products (PC8_1, PC35_1)

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	No spray
Amount used, frequency and duration of use (or from service life)		
Amount per Application	:	<= 50 g/event
Exposure frequency	:	1 events/day
Duration	:	Duration of exposure by events 1 h
Use frequency	:	Frequent
Other conditions affecting consumers exposure		
Indoor or outdoor use	:	Indoor use

6.2.3. Control of consumer exposure: Washing and cleaning products (PC35) / Surface cleaners (liquid) ()

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Amount used, frequency and duration of use (or from service life)		
Amount used per event	:	<= 60 g
Exposure frequency	:	1 events/day
Duration	:	Duration of exposure by events 0.33 h
Use frequency	:	Frequent
Other conditions affecting consumers exposure		
Indoor or outdoor use	:	Indoor use

6.2.4. Control of consumer exposure: Washing and cleaning products (PC35) / Toilet cleaners (liquid) ()

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Amount used, frequency and duration of use (or from service life)		
Amount per Application	:	<= 55 g/event
Exposure frequency	:	1 events/day
Duration	:	Inhalation exposure duration per event <= 7 min
Duration	:	Dermal exposure duration per event <= 2 min
Use frequency	:	Frequent
Other conditions affecting consumers exposure		
Indoor or outdoor use	:	Indoor use

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Room size	:	>= 2.5 m3
Ventilation rate	:	>= 2

6.2.5. Control of consumer exposure: Washing and cleaning products (PC35) / Carpet cleaning (liquids) ()

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Amount used, frequency and duration of use (or from service life)		
Amount per Application	:	<= 687.5 g/event
Exposure frequency	:	1 events/day
Product amount ingested	:	<= 0.00184 g/event
Duration	:	Application duration <= 30 min
Duration	:	Inhalation exposure duration per event <= 240 min
Duration	:	Dermal exposure duration per event <= 60 min
Use frequency	:	Frequent
Other conditions affecting consumers exposure		
Indoor or outdoor use	:	Indoor use
Room size	:	>= 58 m3
Ventilation rate	:	>= 0.5

6.2.6. Control of consumer exposure: Washing and cleaning products (PC35) / Wipes ()

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Amount used, frequency and duration of use (or from service life)		
Exposure frequency	:	1 events/day
Use frequency	:	Frequent

6.2.7. Control of consumer exposure: Washing and cleaning products (PC35) / High pressure washers/cleaners (AISE-SP-C0021)

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid No spray
Amount used, frequency and duration of use (or from service life)		
Amount per Application	:	<= 50 g/event
Exposure frequency	:	1 events/day

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Duration	:	Duration of exposure by events <= 5 h
Use frequency	:	Infrequent
Other conditions affecting consumers exposure		
Indoor or outdoor use	:	Indoor use

6.2.8. Control of consumer exposure: Washing and cleaning products (PC35) / Automotive Care Products (PC6)

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Amount per Application	:	<= 5.769 g/event
Exposure frequency	:	1 events/day
Product amount in contact to skin	:	<= 0.286 g/event
Duration	:	Application duration <= 20 min
Duration	:	Inhalation exposure duration per event <= 60 min
Use frequency	:	Infrequent
Other conditions affecting consumers exposure		
Indoor or outdoor use	:	Indoor use
Room size	:	>= 15 m3
Ventilation rate	:	>= 2.5

6.2.9. Control of consumer exposure: Washing and cleaning products (PC35) / Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners) (PC8_3, PC35_3)

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Sprays
Amount used, frequency and duration of use (or from service life)		
Amount per Application	:	<= 35 g/event
Exposure frequency	:	1 events/day
Duration	:	Duration of exposure by events 4 h
Use frequency	:	Frequent
Other conditions affecting consumers exposure		
Indoor or outdoor use	:	Indoor use

6.2.10. Control of consumer exposure: Washing and cleaning products (PC35) / Surface care, trigger sprays ()

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Product (article) characteristics		
Covers the percentage of the substance in the product up to 0,998 %		
Physical form of product	:	Sprays
Amount used, frequency and duration of use (or from service life)		
Amount per Application	:	<= 35 g/event
Exposure frequency	:	1 events/day
Duration	:	Duration of exposure by events 4 h
Use frequency	:	Frequent
Other conditions affecting consumers exposure		
Indoor or outdoor use	:	Indoor use

6.2.11. Control of consumer exposure: Washing and cleaning products (PC35) / Kitchen cleaner () / Liquids (PC24_1)

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Amount per Application	:	<= 60 g/event
Exposure frequency	:	1 events/day
Duration	:	Duration of exposure by events 0.33 h
Use frequency	:	Frequent
Other conditions affecting consumers exposure		
Indoor or outdoor use	:	Indoor use

6.2.12. Control of consumer exposure: Washing and cleaning products (PC35) / Kitchen cleaner () / Sprays (PC24_3)

Product (article) characteristics		
Covers concentrations up to 0.5 %		
Physical form of product	:	Sprays
Amount used, frequency and duration of use (or from service life)		
Amount per Application	:	<= 35 g/event
Exposure frequency	:	1 events/day
Duration	:	Duration of exposure by events 4 h
Use frequency	:	Frequent
Other conditions affecting consumers exposure		

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Indoor or outdoor use	:	Indoor use

6.3. Exposure estimation and reference to its source

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

Compartment	Exposure level	RCR
Freshwater	0.00741 mg/L (EUSES v2.1)	0.037
Freshwater sediment	0.04 mg/kg dry weight (EUSES v2.1)	0.034
Marine water	0.000668 mg/L (EUSES v2.1)	< 0.01
Marine sediment	0.00359 mg/kg dry weight (EUSES v2.1)	0.03
Sewage treatment plant	0.059 mg/L (EUSES v2.1)	< 0.01
Agricultural soil	0.00938 mg/kg dry weight (EUSES v2.1)	< 0.01
Man via environment - Inhalation	0.0000758 mg/m³ (EUSES v2.1)	< 0.01
Man via environment - Oral	0.00086 mg/kg bw/day (EUSES v2.1)	< 0.01
Man via environment - combined routes		< 0.01

6.3.2. Consumer exposure: Washing and cleaning products (PC35) / Laundry and dish washing products (PC8_1, PC35_1)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.384 mg/m³ (AISE REACT)	0.026
dermal	systemic	long-term	0.763 mg/kg bw/day (AISE REACT)	0.153
combined routes	systemic	long-term		0.178

6.3.3. Consumer exposure: Washing and cleaning products (PC35) / Surface cleaners (liquid) ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.028 mg/m³ (AISE REACT)	< 0.01
dermal	systemic	long-term	1.43 mg/kg bw/day (AISE REACT)	0.286
combined routes	systemic	long-term		0.288

6.3.4. Consumer exposure: Washing and cleaning products (PC35) / Toilet cleaners (liquid) ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.00011 mg/m³ (ConsExpo web 1.1.0)	< 0.01
dermal	systemic	long-term	0.027 mg/kg bw/day (ConsExpo web	< 0.01

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			1.1.0)	
combined routes	systemic	long-term		< 0.01

6.3.5. Consumer exposure: Washing and cleaning products (PC35) / Carpet cleaning (liquids) ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.0029 mg/m³ (ConsExpo web 1.1.0)	< 0.01
dermal	systemic	long-term	0.295 mg/kg bw/day (ConsExpo web 1.1.0)	0.059
oral	systemic	long-term	0.033 mg/kg bw/day (ConsExpo web 1.1.0)	< 0.01
combined routes	systemic	long-term		0.066

6.3.6. Consumer exposure: Washing and cleaning products (PC35) / Wipes ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
dermal	systemic	long-term	1.43 mg/kg bw/day (AISE REACT)	0.286

6.3.7. Consumer exposure: Washing and cleaning products (PC35) / High pressure washers/cleaners (AISE-SP-C0021)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	6.25 mg/m³ (ECETOC TRA consumer v3)	0.417
dermal	systemic	long-term	1.429 mg/kg bw/day (ECETOC TRA consumer v3)	0.286
combined routes	systemic	long-term		0.702

6.3.8. Consumer exposure: Washing and cleaning products (PC35) / Automotive Care Products (PC6)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.000024 mg/m³ (ConsExpo web 1.1.0)	< 0.01
dermal	systemic	long-term	0.00164 mg/kg bw/day (ConsExpo web 1.1.0)	< 0.01
combined routes	systemic	long-term		< 0.01

6.3.9. Consumer exposure: Washing and cleaning products (PC35) / Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners) (PC8_3, PC35_3)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	5.147 mg/m³ (ECETOC TRA consumer v3)	0.343
dermal	systemic	long-term	1.429 mg/kg bw/day	0.286

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			(ECETOC TRA consumer v3)	
combined routes	systemic	long-term		0.629

6.3.10. Consumer exposure: Washing and cleaning products (PC35) / Surface care, trigger sprays ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	5.137 mg/m³ (ECETOC TRA consumer v3)	0.342
dermal	systemic	long-term	1.426 mg/kg bw/day (ECETOC TRA consumer v3)	0.285
combined routes	systemic	long-term		0.628

6.3.11. Consumer exposure: Washing and cleaning products (PC35) / Kitchen cleaner () / Liquids (PC24_1)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.028 mg/m³ (AISE REACT)	< 0.01
dermal	systemic	long-term	1.43 mg/kg bw/day (AISE REACT)	0.286
combined routes	systemic	long-term		0.288

6.3.12. Consumer exposure: Washing and cleaning products (PC35) / Kitchen cleaner () / Sprays (PC24_3)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	2.574 mg/m³ (ECETOC TRA consumer v3)	0.172
dermal	systemic	long-term	0.715 mg/kg bw/day (ECETOC TRA consumer v3)	0.143
combined routes	systemic	long-term		0.314

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

Environment
If a DU has OC/RMMs outside specifications in the ES, then the DU can evaluate whether he works inside the boundaries set by the ES through scaling in EUSES.
The main driving parameters are :
- local amount used (tonnage)
- release factor prior to on-site treatment
- on-site wastewater treatment presence and efficiency
- dilution factor

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Human Health
Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

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ES7: Consumer use, Consumer end-use of air care products (IFRA GES 7)

7.1. Title section

Structured Short Title	:	Consumer use

Environment		
CS1	**End use of air care products**	ERC8a,
Consumer		
CS2	**Air fresheners aerosols (aqueous, non-aqueous, concentrated (mini-aerosol) Timed-release aerosols) for consumer use**	PC3_1,
CS3	**Static room diffuser with rattan sticks**	PC3,
CS4	**Candles**	PC3_2,
CS5	**Electric room diffuser**	PC3_2,

7.2. Conditions of use affecting exposure

7.2.1. Control of environmental exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a) / End use of air care products ()

Amount used, frequency and duration of use (or from service life)		
Fraction of EU tonnage used in region:	:	10 %
Daily amount per site	:	<= 0.652 kg
Maximum daily local emission to waste water	:	0.652 kg
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	No specific measures identified.

7.2.2. Control of consumer exposure: Air care, instant action (aerosol sprays) (PC3_1) / Air fresheners aerosols (aqueous, non-aqueous, concentrated (mini-aerosol) Timed-release aerosols) for consumer use ()

Product (article) characteristics		
Covers concentrations up to 0.25 %		
Physical form of product	:	Aerosol Sprays
Amount used, frequency and duration of use (or from service life)		
Amount per Application	:	<= 10 g/event
Exposure frequency	:	4 events/day
Duration	:	Duration of exposure by events 15 min

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Use frequency	:	Frequent
Other conditions affecting consumers exposure		
Indoor or outdoor use	:	Indoor use

7.2.3. Control of consumer exposure: Air care products (PC3) / Static room diffuser with rattan sticks ()

Product (article) characteristics		
Covers concentrations up to 89.8 %		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Amount per Application	:	<= 367 g/event
Exposure frequency	:	1 events/day
Product amount in contact to skin	:	<= 0.6 g/event
Duration	:	Application duration <= 90.3 d
Duration	:	Inhalation exposure duration per event <= 90.3 d
Use frequency	:	Infrequent
Other conditions affecting consumers exposure		
Indoor or outdoor use	:	Indoor use
Room size	:	>= 20 m3
Ventilation rate	:	>= 0.6

7.2.4. Control of consumer exposure: Air care, continuous action (solid and liquid) (PC3_2) / Candles ()

Product (article) characteristics		
Covers concentrations up to 9.98 %		
Physical form of product	:	No spray
Amount used, frequency and duration of use (or from service life)		
Amount per Application	:	<= 50 g/event
Exposure frequency	:	1 events/day
Duration	:	Exposure duration 8 h
Use frequency	:	Frequent
Other conditions affecting consumers exposure		
Indoor or outdoor use	:	Indoor use

7.2.5. Control of consumer exposure: Air care, continuous action (solid and liquid) (PC3_2) / Electric room diffuser ()

Product (article) characteristics		

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Covers concentrations up to 49.9 %		
Physical form of product	:	No spray
Amount used, frequency and duration of use (or from service life)		
Amount per Application	:	<= 50 g/event
Exposure frequency	:	1 events/day
Duration	:	Exposure duration 8 h
Use frequency	:	Frequent
Other conditions affecting consumers exposure		
Indoor or outdoor use	:	Indoor use

7.3. Exposure estimation and reference to its source

7.3.1. Environmental release and exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a) / End use of air care products ()

Compartment	Exposure level	RCR
Freshwater	0.034 mg/L (EUSES v2.1)	0.17
Freshwater sediment	0.183 mg/kg dry weight (EUSES v2.1)	0.155
Marine water	0.00333 mg/L (EUSES v2.1)	0.017
Marine sediment	0.018 mg/kg dry weight (EUSES v2.1)	0.151
Sewage treatment plant	0.325 mg/L (EUSES v2.1)	0.033
Agricultural soil	0.012 mg/kg dry weight (EUSES v2.1)	< 0.01
Man via environment - Inhalation	0.0000759 mg/m³ (EUSES v2.1)	< 0.01
Man via environment - Oral	0.00138 mg/kg bw/day (EUSES v2.1)	< 0.01
Man via environment - combined routes		< 0.01

7.3.2. Consumer exposure: Air care, instant action (aerosol sprays) (PC3_1) / Air fresheners aerosols (aqueous, non-aqueous, concentrated (mini-aerosol) Timed-release aerosols) for consumer use ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	4.348 mg/m³ (ECETOC TRA consumer v3)	0.29

7.3.3. Consumer exposure: Air care products (PC3) / Static room diffuser with rattan sticks ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	1.4 mg/m³ (ConsExpo web 1.1.0)	0.093
dermal	systemic	long-term	0.296 mg/kg bw/day	0.059

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			(ConsExpo web 1.1.0)	
oral	systemic	long-term	0.014 mg/kg bw/day (ConsExpo web 1.1.0)	< 0.01
combined routes	systemic	long-term		0.155

7.3.4. Consumer exposure: Air care, continuous action (solid and liquid) (PC3_2) / Candles ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.011 mg/m³ (AISE REACT)	< 0.01
dermal	systemic	long-term	0.059 mg/kg bw/day (ECETOC TRA consumer v3)	0.012
combined routes	systemic	long-term		0.013

7.3.5. Consumer exposure: Air care, continuous action (solid and liquid) (PC3_2) / Electric room diffuser ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.057 mg/m³ (AISE REACT)	< 0.01
dermal	systemic	long-term	0.297 mg/kg bw/day (ECETOC TRA consumer v3)	0.059
combined routes	systemic	long-term		0.063

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

Environment
If a DU has OC/RMMs outside specifications in the ES, then the DU can evaluate whether he works inside the boundaries set by the ES through scaling in EUSES.
The main driving parameters are :
- local amount used (tonnage)
- release factor prior to on-site treatment
- on-site wastewater treatment presence and efficiency
- dilution factor

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Human Health
Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

ES8: Consumer use, Consumers end-use polishes and wax blends (IFRA GES 9)

8.1. Title section

Structured Short Title	:	Consumer use

Environment		
CS1	**End-uses of polish and wax blends**	ERC8a,
Consumer		
CS2	**Polishes, wax / cream (floor, furniture, shoes)**	PC31_1
CS3	**Polishes, spray (furniture, shoes)**	PC31, PC23_2, PC31_2

8.2. Conditions of use affecting exposure

8.2.1. Control of environmental exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a) / End-uses of polish and wax blends ()

Amount used, frequency and duration of use (or from service life)		
Fraction of EU tonnage used in region:	:	10 %
Daily amount per site	:	<= 0.118 kg
Maximum daily local emission to waste water	:	0.118 kg
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	No specific measures identified.

8.2.2. Control of consumer exposure: Polishes, wax / cream (floor, furniture, shoes) (PC31_1)

Product (article) characteristics		
Covers concentrations up to 0.1 %		
Physical form of product	:	No spray
Amount used, frequency and duration of use (or from service life)		
Amount per Application	:	<= 550 g/event
Exposure frequency	:	1 events/day
Duration	:	Duration of exposure by events 4 h
Use frequency	:	Frequent
Other conditions affecting consumers exposure		
Indoor or outdoor use	:	Indoor use

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8.2.3. Control of consumer exposure: Polishes and wax blends (PC31) / Polishes, spray (furniture, shoes) (PC23_2, PC31_2)

Product (article) characteristics		
Covers concentrations up to 0.1 %		
Physical form of product	:	Sprays
Amount used, frequency and duration of use (or from service life)		
Amount per Application	:	<= 135 g/event
Exposure frequency	:	1 events/day
Duration	:	Duration of exposure by events 4 h
Use frequency	:	Frequent
Other conditions affecting consumers exposure		
Indoor or outdoor use	:	Indoor use

8.3. Exposure estimation and reference to its source

8.3.1. Environmental release and exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a) / End-uses of polish and wax blends ()

Compartment	Exposure level	RCR
Freshwater	0.00741 mg/L (EUSES v2.1)	0.037
Freshwater sediment	0.04 mg/kg dry weight (EUSES v2.1)	0.034
Marine water	0.000668 mg/L (EUSES v2.1)	< 0.01
Marine sediment	0.00359 mg/kg dry weight (EUSES v2.1)	0.03
Sewage treatment plant	0.059 mg/L (EUSES v2.1)	< 0.01
Agricultural soil	0.00938 mg/kg dry weight (EUSES v2.1)	< 0.01
Man via environment - Inhalation	0.0000758 mg/m³ (EUSES v2.1)	< 0.01
Man via environment - Oral	0.00086 mg/kg bw/day (EUSES v2.1)	< 0.01
Man via environment - combined routes		< 0.01

8.3.2. Consumer exposure: Polishes, wax / cream (floor, furniture, shoes) (PC31_1)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	8.088 mg/m³ (ECETOC TRA consumer v3)	0.539
dermal	systemic	long-term	0.143 mg/kg bw/day (ECETOC TRA consumer v3)	0.029

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combined routes	systemic	long-term		0.568

8.3.3. Consumer exposure: Polishes and wax blends (PC31) / Polishes, spray (furniture, shoes) (PC23_2, PC31_2)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	1.985 mg/m³ (ECETOC TRA consumer v3)	0.132
dermal	systemic	long-term	0.143 mg/kg bw/day (ECETOC TRA consumer v3)	0.029
combined routes	systemic	long-term		0.161

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

Environment
If a DU has OC/RMMs outside specifications in the ES, then the DU can evaluate whether he works inside the boundaries set by the ES through scaling in EUSES.
The main driving parameters are :
- local amount used (tonnage)
- release factor prior to on-site treatment
- on-site wastewater treatment presence and efficiency
- dilution factor

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Human Health
Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

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ES9: Formulation or re-packing, Industrial formulation of personal care products

9.1. Title section

Structured Short Title	:	Formulation or re-packing

Environment		
CS1	**Industrial formulation of personal care products**	ERC2,
Worker		
CS2	**General process exposures, no sampling**	PROC1,, CS57
CS3	**General process exposures, With sample collection**	PROC2,, CS56
CS4	**General process exposures**	PROC3,
CS5	**General exposures open batch process including aerosols**	PROC4,
CS6	**Batch processes at elevated temperatures (e.g. solvents resin manufacture, grease manufacture)**	PROC3,
CS7	**Sample collection**	PROC3,
CS8	**Laboratory activities**	PROC15, CS36
CS9	**Bulk transfers, Drum/batch transfers**	PROC8b, CS14, CS8
CS10	**Mixing operations (open systems)**	PROC5, CS30
CS11	**Transfer from/pouring from containers, Manual**	PROC8a, CS22, CS34
CS12	**Tabletting, compression, extrusion or pelletisation**	PROC14
CS13	**Drum and small package filling**	PROC9, CS6
CS14	**Clean down and Maintenance**	PROC8a,
CS15	**Storage**	PROC1,
CS16	**Storage**	PROC2,

9.2. Conditions of use affecting exposure

9.2.1. Control of environmental exposure: Formulation into mixture (ERC2) / Industrial formulation of personal care products ()

Amount used, frequency and duration of use (or from service life)		
Annual amount per site	:	<= 500 t
Daily amount per site	:	<= 5 t
Maximum daily local emission to waste water	:	0 kg
Maximum daily local emission to air	:	5 t
Conditions and measures related to sewage treatment plant		

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STP type	:	Biological Sewage Treatment Plant
STP sludge treatment	:	Sewage sludge may be recovered for agricultural or horticultural purposes
STP effluent	:	2,000 m3/d
STP Water - minimum efficiency of 0.255 %		
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	Particular considerations on the waste treatment operations
Other conditions affecting environmental exposure		
Receiving surface water flow	:	18,000 m3/d

9.2.2. Control of worker exposure: Use in closed process, no likelihood of exposure (PROC1) / General process exposures () / no sampling (CS57)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity <= 1 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands.		
Avoid splashing.		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
without local exhaust ventilation		
Use in closed process, no likelihood of exposure		
Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

9.2.3. Control of worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / General process exposures () / with sample collection (CS56)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity <= 1 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands.		
Avoid splashing.		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
without local exhaust ventilation		
Closed continuous process with occasional controlled exposure		
Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity <= 1 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands.		
Avoid splashing.		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
without local exhaust ventilation		
Closed batch process with occasional controlled exposure		

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Occupational Health and Safety Management System: Advanced.
Conditions and measures related to personal protection, hygiene and health evaluation
General measures (eye irritants)
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %
For further specification, refer to section 8 of the SDS.
Other conditions affecting workers exposure

Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

9.2.5. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4) / General exposures open batch process including aerosols ()

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

Physical form of product	:	Liquid

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

Use frequency	:	Duration of the activity <= 1 h/day

Technical and organisational conditions and measures
Avoid direct eye contact with product, also via contamination on hands.
Avoid splashing.
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Local exhaust ventilation Inhalation - minimum efficiency of >= 90 %
Occupational Health and Safety Management System: Advanced.
Conditions and measures related to personal protection, hygiene and health evaluation
General measures (eye irritants)
Use suitable eye protection.
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %
For further specification, refer to section 8 of the SDS.
Other conditions affecting workers exposure

Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

9.2.6. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Batch processes at elevated temperatures (e.g. solvents resin manufacture, grease manufacture) ()

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity <= 1 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands.		
Avoid splashing.		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Local exhaust ventilation Inhalation - minimum efficiency of >= 90 %		
Closed batch process with occasional controlled exposure		
Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity <= 15 min/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands.		
Avoid splashing.		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
without local exhaust ventilation		
Closed batch process with occasional controlled exposure		
Occupational Health and Safety Management System: Advanced.		

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Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

9.2.8. Control of worker exposure: Use as laboratory reagent (PROC15) / Laboratory activities (CS36)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity <= 1 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands.		
Avoid splashing.		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Local exhaust ventilation Inhalation - minimum efficiency of >= 90 %		
Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

9.2.9. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Bulk transfers (CS14) / Drum/batch transfers (CS8)

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

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Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity <= 1 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands.		
Avoid splashing.		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Local exhaust ventilation Inhalation - minimum efficiency of >= 95 %		
Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
Use suitable eye protection.		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

9.2.10. Control of worker exposure: Mixing or blending in batch processes (PROC5) / Mixing operations (open systems) (CS30)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid Aerosol
Amount used, frequency and duration of use (or from service life)		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands.		
Avoid splashing.		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Local exhaust ventilation Inhalation - minimum efficiency of >= 90 %		
Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
Use suitable eye protection.		

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Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

9.2.11. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer from/pouring from containers (CS22) / Manual (CS34)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity <= 1 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands.		
Avoid splashing.		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Local exhaust ventilation Inhalation - minimum efficiency of >= 90 %		
Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
Use suitable eye protection.		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		

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Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands.		
Avoid splashing.		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Local exhaust ventilation Inhalation - minimum efficiency of >= 90 %		
Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

9.2.13. Control of worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Drum and small package filling (CS6)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands.		
Avoid splashing.		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Local exhaust ventilation Inhalation - minimum efficiency of >= 90 %		
Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		

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Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

9.2.14. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Clean down and Maintenance ()

Product (article) characteristics		
Covers concentrations up to 0.8 %		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity <= 4 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands.		
Avoid splashing.		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
without local exhaust ventilation		
Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
Use suitable eye protection.		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity <= 15 min/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands.		

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Avoid splashing.
Use in closed process, no likelihood of exposure
Occupational Health and Safety Management System: Advanced.
Conditions and measures related to personal protection, hygiene and health evaluation
General measures (eye irritants)
For further specification, refer to section 8 of the SDS.
Other conditions affecting workers exposure

Indoor or outdoor use	:	Outdoor use
Temperature	:	Assumes process temperature up to 40 °C

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

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

Physical form of product	:	Liquid

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

Use frequency	:	Duration of the activity <= 15 min/day

Technical and organisational conditions and measures
Avoid direct eye contact with product, also via contamination on hands.
Avoid splashing.
Closed continuous process with occasional controlled exposure
Occupational Health and Safety Management System: Advanced.
Conditions and measures related to personal protection, hygiene and health evaluation
General measures (eye irritants)
For further specification, refer to section 8 of the SDS.
Other conditions affecting workers exposure

Indoor or outdoor use	:	Outdoor use
Temperature	:	Assumes process temperature up to 40 °C

9.3. Exposure estimation and reference to its source

9.3.1. Environmental release and exposure: Formulation into mixture (ERC2) / Industrial formulation of personal care products ()

Compartment	Exposure level	RCR
Freshwater	0.00151 mg/L (EUSES v2.1)	< 0.01

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Freshwater sediment	0.00813 mg/kg dry weight (EUSES v2.1)	< 0.01
Marine water	0.0000787 mg/L (EUSES v2.1)	< 0.01
Marine sediment	0.000423 mg/kg dry weight (EUSES v2.1)	< 0.01
Sewage treatment plant	0 mg/L (EUSES v2.1)	< 0.01
Agricultural soil	0.253 mg/kg dry weight (EUSES v2.1)	0.101
Man via environment - Inhalation	0.381 mg/m³ (EUSES v2.1)	0.025
Man via environment - Oral	0.903 mg/kg bw/day (EUSES v2.1)	0.181
Man via environment - combined routes		0.206

9.3.2. Worker exposure: Use in closed process, no likelihood of exposure (PROC1) / General process exposures () / no sampling (CS57)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.011 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	0.034 mg/kg bw/day (ECETOC TRA worker v3)	< 0.01
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		< 0.01

9.3.3. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / General process exposures () / with sample collection (CS56)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	1.101 mg/m³ (ECETOC TRA worker v3)	0.018
dermal	systemic	long-term	0.274 mg/kg bw/day (ECETOC TRA worker v3)	0.027
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		0.046

9.3.4. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / General process exposures ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	3.304 mg/m³ (ECETOC TRA	0.055

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			worker v3)	
dermal	systemic	long-term	0.138 mg/kg bw/day (ECETOC TRA worker v3)	0.014
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		0.069

9.3.5. Worker exposure: Chemical production where opportunity for exposure arises (PROC4) / General exposures open batch process including aerosols ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.551 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	1.372 mg/kg bw/day (ECETOC TRA worker v3)	0.137
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		0.146

9.3.6. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Batch processes at elevated temperatures (e.g. solvents resin manufacture, grease manufacture) ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.33 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	0.69 mg/kg bw/day (ECETOC TRA worker v3)	0.069
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		0.075

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	1.652 mg/m³ (ECETOC TRA worker v3)	0.028
dermal	systemic	long-term	0.138 mg/kg bw/day (ECETOC TRA worker v3)	0.014
dermal	local	long-term	(Risk management	

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			measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		0.041

9.3.8. Worker exposure: Use as laboratory reagent (PROC15) / Laboratory activities (CS36)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.551 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	0.068 mg/kg bw/day (ECETOC TRA worker v3)	< 0.01
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		0.016

9.3.9. Worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Bulk transfers (CS14) / Drum/batch transfers (CS8)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.275 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	2.742 mg/kg bw/day (ECETOC TRA worker v3)	0.274
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		0.279

9.3.10. Worker exposure: Mixing or blending in batch processes (PROC5) / Mixing operations (open systems) (CS30)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	2.753 mg/m³ (ECETOC TRA worker v3)	0.046
dermal	systemic	long-term	2.742 mg/kg bw/day (ECETOC TRA worker v3)	0.274
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		0.32

9.3.11. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer from/pouring from containers (CS22) / Manual (CS34)

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Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	1.101 mg/m³ (ECETOC TRA worker v3)	0.018
dermal	systemic	long-term	2.742 mg/kg bw/day (ECETOC TRA worker v3)	0.274
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		0.293

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	2.753 mg/m³ (ECETOC TRA worker v3)	0.046
dermal	systemic	long-term	0.686 mg/kg bw/day (ECETOC TRA worker v3)	0.069
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		0.114

9.3.13. Worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Drum and small package filling (CS6)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	2.753 mg/m³ (ECETOC TRA worker v3)	0.046
dermal	systemic	long-term	1.372 mg/kg bw/day (ECETOC TRA worker v3)	0.137
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		0.183

9.3.14. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Clean down and Maintenance ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	3.304 mg/m³ (ECETOC TRA worker v3)	0.055
dermal	systemic	long-term	0.274 mg/kg bw/day (ECETOC TRA worker v3)	0.027

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dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		0.082

9.3.15. Worker exposure: Use in closed process, no likelihood of exposure (PROC1) / Storage ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.00385 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	0.034 mg/kg bw/day (ECETOC TRA worker v3)	< 0.01
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		< 0.01

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.385 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	1.37 mg/kg bw/day (ECETOC TRA worker v3)	0.137
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	
combined routes	systemic	long-term		0.143

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

Environment
If a DU has OC/RMMs outside specifications in the ES, then the DU can evaluate whether he works inside the boundaries set by the ES through scaling in EUSES.
The main driving parameters are :
- local amount used (tonnage)
- release factor prior to on-site treatment
- on-site wastewater treatment presence and efficiency
- dilution factor

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Human Health
Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

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ES10: Formulation or re-packing, Industrial formulation of personal care end-products

10.1. Title section

Structured Short Title	:	Formulation or re-packing

Environment		
CS1	**Industrial formulation end-products**	ERC2,
Worker		
CS2	**Uploading/unloading**	PROC8b,
CS3	**Sampling of received goods**	PROC2,
CS4	**Quality control of received goods**	PROC15,
CS5	**Storage**	PROC1,
CS6	**Closed system mixing including filling process equipment**	PROC3,
CS7	**Batch mixing with significant contact including filling process**	PROC5,
CS8	**Maintenance and cleaning**	PROC8a,
CS9	**Sampling of compounds**	PROC2,
CS10	**Quality control of compounds**	PROC15,
CS11	**Charging/discharging from/to vessels/large**	PROC8b,
CS12	**Transfer in a small containers**	PROC9,
CS13	**Production of preparations or articles by tabletting, compression, extrusion, pelletisation**	PROC14

10.2. Conditions of use affecting exposure

10.2.1. Control of environmental exposure: Formulation into mixture (ERC2) / Industrial formulation end-products ()

Amount used, frequency and duration of use (or from service life)		
Fraction of EU tonnage used in region:	:	100 %
Daily amount per site	:	<= 5 t
Annual amount per site	:	<= 500 t
Maximum daily local emission to waste water	:	0 kg
Maximum daily local emission to air	:	5000 kg
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal Sewage Treatment Plant
STP sludge treatment	:	Sewage sludge may be recovered for agricultural or horticultural purposes
STP effluent	:	2,000 m3/d

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STP Water - minimum efficiency of 0.255 %
Conditions and measures related to treatment of waste (including article waste)
Waste treatment : No specific measures identified.
Other conditions affecting environmental exposure
Receiving surface water flow : 18,000 m3/d

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

Product (article) characteristics
Covers concentrations up to 0.4 %
Physical form of product : Liquid
Amount used, frequency and duration of use (or from service life)
Use frequency : Duration of the activity 1 h/day
Technical and organisational conditions and measures
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced.
Conditions and measures related to personal protection, hygiene and health evaluation
General measures (eye irritants) Use suitable eye protection.
For further specification, refer to section 8 of the SDS.
Other conditions affecting workers exposure
Indoor or outdoor use : Indoor use
Temperature : Assumes process temperature up to 40 °C

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

Product (article) characteristics
Covers percentage substance in the product up to 25 %.
Physical form of product : Liquid
Amount used, frequency and duration of use (or from service life)
Use frequency : Duration of the activity 15 min/day

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Technical and organisational conditions and measures
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Closed continuous process with occasional controlled exposure Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced.
Conditions and measures related to personal protection, hygiene and health evaluation
General measures (eye irritants)
For further specification, refer to section 8 of the SDS.
Other conditions affecting workers exposure

Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

10.2.4. Control of worker exposure: Use as laboratory reagent (PROC15) / Quality control of received goods ()

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

Physical form of product	:	Liquid

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

Use frequency	:	Duration of the activity 15 min/day

Technical and organisational conditions and measures
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced.
Conditions and measures related to personal protection, hygiene and health evaluation
General measures (eye irritants)
For further specification, refer to section 8 of the SDS.
Other conditions affecting workers exposure

Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

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

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

Physical form of product	:	Liquid

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Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 1 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Use in closed process, no likelihood of exposure Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

10.2.6. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Closed system mixing including filling process equipment ()

Product (article) characteristics		
Covers percentage substance in the product up to 25 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 4 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced. Closed batch process with occasional controlled exposure		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

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10.2.7. Control of worker exposure: Mixing or blending in batch processes (PROC5) / Batch mixing with significant contact including filling process ()

Product (article) characteristics		
Covers concentrations up to 0.4 %		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 4 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants) Use suitable eye protection.		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 4 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants) Use suitable eye protection.		
For further specification, refer to section 8 of the SDS.		

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

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

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 15 min/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Closed continuous process with occasional controlled exposure Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

10.2.10. Control of worker exposure: Use as laboratory reagent (PROC15) / Quality control of compounds ()

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 15 min/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced.		

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Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

10.2.11. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Charging/discharging from/to vessels/large ()

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 1 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants) Use suitable eye protection.		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 1 h/day

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Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

10.2.13. Control of worker exposure: Production of preparations or articles by tabletting, compression, extrusion, pelletisation (PROC14)

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

10.3. Exposure estimation and reference to its source

10.3.1. Environmental release and exposure: Formulation into mixture (ERC2) / Industrial formulation end-products ()

Compartment	**Exposure level**	**RCR**
Freshwater	0.00151 mg/L (EUSES v2.1)	< 0.01

Freshwater sediment	0.00813 mg/kg dry weight (EUSES v2.1)	< 0.01
Marine water	0.0000787 mg/L (EUSES v2.1)	< 0.01
Marine sediment	0.000423 mg/kg dry weight (EUSES v2.1)	< 0.01
Sewage treatment plant	0 mg/L (EUSES v2.1)	< 0.01
Agricultural soil	0.253 mg/kg dry weight (EUSES v2.1)	0.101
Man via environment - Inhalation	0.381 mg/m³ (EUSES v2.1)	0.025
Man via environment - Oral	0.903 mg/kg bw/day (EUSES v2.1)	0.181
Man via environment - combined routes		0.206

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.551 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	1.371 mg/kg bw/day (ECETOC TRA worker v3)	0.137
combined routes	systemic	long-term		0.146
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.33 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	0.822 mg/kg bw/day (ECETOC TRA worker v3)	0.082
combined routes	systemic	long-term		0.088
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

10.3.4. Worker exposure: Use as laboratory reagent (PROC15) / Quality control of received goods ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	1.652 mg/m³ (ECETOC TRA worker v3)	0.028
dermal	systemic	long-term	0.204 mg/kg bw/day	0.02

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			(ECETOC TRA worker v3)	
combined routes	systemic	long-term		0.048
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.00661 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	0.02 mg/kg bw/day (ECETOC TRA worker v3)	< 0.01
combined routes	systemic	long-term		< 0.01
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

10.3.6. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Closed system mixing including filling process equipment ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	5.947 mg/m³ (ECETOC TRA worker v3)	0.099
dermal	systemic	long-term	0.414 mg/kg bw/day (ECETOC TRA worker v3)	0.041
combined routes	systemic	long-term		0.141
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

10.3.7. Worker exposure: Mixing or blending in batch processes (PROC5) / Batch mixing with significant contact including filling process ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	1.652 mg/m³ (ECETOC TRA worker v3)	0.028
dermal	systemic	long-term	1.371 mg/kg bw/day (ECETOC TRA worker v3)	0.137
combined routes	systemic	long-term		0.165
dermal	local	long-term	(Risk management measures are based	

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			on qualitative risk characterisation.)	

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	3.304 mg/m³ (ECETOC TRA worker v3)	0.055
dermal	systemic	long-term	1.371 mg/kg bw/day (ECETOC TRA worker v3)	0.137
combined routes	systemic	long-term		0.192
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

10.3.9. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Sampling of compounds ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.055 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	0.137 mg/kg bw/day (ECETOC TRA worker v3)	0.014
combined routes	systemic	long-term		0.015
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

10.3.10. Worker exposure: Use as laboratory reagent (PROC15) / Quality control of compounds ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.275 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	0.034 mg/kg bw/day (ECETOC TRA worker v3)	< 0.01
combined routes	systemic	long-term		< 0.01
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

10.3.11. Worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Charging/discharging from/to vessels/large ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR

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inhalative	systemic	long-term	0.551 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	1.371 mg/kg bw/day (ECETOC TRA worker v3)	0.137
combined routes	systemic	long-term		0.146
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.551 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	0.686 mg/kg bw/day (ECETOC TRA worker v3)	0.069
combined routes	systemic	long-term	(ECETOC TRA worker v3)	0.078
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

10.3.13. Worker exposure: Production of preparations or articles by tabletting, compression, extrusion, pelletisation (PROC14)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	2.753 mg/m³ (ECETOC TRA worker v3)	0.046
dermal	systemic	long-term	0.343 mg/kg bw/day (ECETOC TRA worker v3)	0.034
combined routes	systemic	long-term		0.08
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

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

Environment
If a DU has OC/RMMs outside specifications in the ES, then the DU can evaluate whether he works inside the boundaries set by the ES through scaling in EUSES.
The main driving parameters are :
- local amount used (tonnage)
- release factor prior to on-site treatment
- on-site wastewater treatment presence and efficiency

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- dilution factor
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Human Health
Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

ES11: Consumer use, End use of cosmetic products

11.1. Title section

Structured Short Title	:	Consumer use

Environment		
CS1	**End use of cosmetic products**	ERC8a,
Consumer		
CS2	**End use of cosmetic products**	PC39,
CS3	**End use of cosmetic products**	PC28,

11.2. Conditions of use affecting exposure

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

Amount used, frequency and duration of use (or from service life)		
Fraction of EU tonnage used in region:	:	10 %
Daily amount for wide disperse uses	:	<= 0.275 kg
Maximum daily local emission to waste water	:	0.275 kg
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	No specific measures identified.

11.2.2. Control of consumer exposure: Cosmetics, personal care products (PC39) / End use of cosmetic products ()

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Amount used, frequency and duration of use (or from service life)		
Exposure frequency	:	1 events/day
Use frequency	:	Frequent
Other conditions affecting consumers exposure		
Indoor or outdoor use	:	Indoor use

11.2.3. Control of consumer exposure: Perfumes, fragrances (PC28) / End use of cosmetic products ()

Product (article) characteristics

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Covers percentage substance in the product up to 100 %.		
Amount used, frequency and duration of use (or from service life)		
Exposure frequency	:	1 events/day
Use frequency	:	Frequent
Other conditions affecting consumers exposure		
Indoor or outdoor use	:	Indoor use

11.3. Exposure estimation and reference to its source

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

Compartment	Exposure level	RCR
Freshwater	0.015 mg/L (EUSES v2.1)	0.076
Freshwater sediment	0.082 mg/kg dry weight (EUSES v2.1)	0.069
Marine water	0.00145 mg/L (EUSES v2.1)	< 0.01
Marine sediment	0.0078 mg/kg dry weight (EUSES v2.1)	0.066
Sewage treatment plant	0.137 mg/L (EUSES v2.1)	0.014
Agricultural soil	0.01 mg/kg dry weight (EUSES v2.1)	< 0.01
Man via environment - Inhalation	0.0000759 mg/m³ (EUSES v2.1)	< 0.01
Man via environment - Oral	0.00091 mg/kg bw/day (EUSES v2.1)	< 0.01
Man via environment - combined routes		< 0.01

11.3.2. Consumer exposure: Cosmetics, personal care products (PC39) / End use of cosmetic products ()

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

11.3.3. Consumer exposure: Perfumes, fragrances (PC28) / End use of cosmetic products ()

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

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

Environment

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If a DU has OC/RMMs outside specifications in the ES, then the DU can evaluate whether he works inside the boundaries set by the ES through scaling in EUSES.
The main driving parameters are :
- local amount used (tonnage)
- release factor prior to on-site treatment
- on-site wastewater treatment presence and efficiency
- dilution factor

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Human Health
Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

ES12: Formulation or re-packing, Industrial formulation of cosmetics compounds

12.1. Title section

Structured Short Title	:	Formulation or re-packing

Environment		
CS1	**Formulation**	ERC2, SU 10
Worker		
CS2	**Uploading/unloading**	PROC8b,
CS3	**Sampling of received goods**	PROC2,
CS4	**Quality control of received goods**	PROC15,
CS5	**Storage**	PROC1,
CS6	**Closed system mixing including filling process equipment**	PROC3,
CS7	**Batch mixing with significant contact including filling process**	PROC5,
CS8	**Maintenance and cleaning**	PROC8a,
CS9	**Sampling of compounds**	PROC2,
CS10	**Quality control of compounds**	PROC15,
CS11	**Charging/discharging from/to vessels/large**	PROC8b,
CS12	**Transfer in a small containers**	PROC9,

12.2. Conditions of use affecting exposure

12.2.1. Control of environmental exposure: Formulation into mixture (ERC2) / Formulation (SU 10)

Amount used, frequency and duration of use (or from service life)		
Fraction of EU tonnage used in region:	:	100 %
Daily amount per site	:	<= 1.8 t
Annual amount per site	:	<= 360 t
Emission Days (days/year):	:	>= 200
Maximum daily local emission to waste water	:	3.6 kg
Maximum daily local emission to air	:	45 kg
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal Sewage Treatment Plant
STP sludge treatment	:	Sewage sludge may be recovered for agricultural or horticultural purposes
STP effluent	:	2,000 m3/d
STP		

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Water - minimum efficiency of 0.255 %		
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	No specific measures identified.
Other conditions affecting environmental exposure		
Receiving surface water flow	:	18,000 m3/d

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

Product (article) characteristics		
Covers concentrations up to 0.8 %		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 1 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants) Use suitable eye protection.		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 15 min/day
Technical and organisational conditions and measures		

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Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Closed continuous process with occasional controlled exposure Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced.
Conditions and measures related to personal protection, hygiene and health evaluation
General measures (eye irritants)
For further specification, refer to section 8 of the SDS.
Other conditions affecting workers exposure

Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

12.2.4. Control of worker exposure: Use as laboratory reagent (PROC15) / Quality control of received goods ()

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

Physical form of product	:	Liquid

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

Use frequency	:	Duration of the activity 15 min/day

Technical and organisational conditions and measures
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced.
Conditions and measures related to personal protection, hygiene and health evaluation
General measures (eye irritants)
For further specification, refer to section 8 of the SDS.
Other conditions affecting workers exposure

Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

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

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

Physical form of product	:	Liquid

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

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Use frequency	:	Duration of the activity 1 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Use in closed process, no likelihood of exposure Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

12.2.6. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Closed system mixing including filling process equipment ()

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 4 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced. Closed batch process with occasional controlled exposure		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

12.2.7. Control of worker exposure: Mixing or blending in batch processes (PROC5) / Batch mixing with significant contact including filling process ()

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Product (article) characteristics		
Covers concentrations up to 0.8 %		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 4 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants) Use suitable eye protection.		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

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

Product (article) characteristics		
Covers concentrations up to 0.8 %		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 4 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants) Use suitable eye protection.		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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Temperature	:	Assumes process temperature up to 40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 25 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 15 min/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Closed continuous process with occasional controlled exposure Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

12.2.10. Control of worker exposure: Use as laboratory reagent (PROC15) / Quality control of compounds ()

Product (article) characteristics		
Covers percentage substance in the product up to 25 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 15 min/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
For further specification, refer to section 8 of the SDS.		

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

12.2.11. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Charging/discharging from/to vessels/large ()

Product (article) characteristics		
Covers concentrations up to 0.8 %		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 1 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants) Use suitable eye protection.		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 25 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 1 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced.		

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Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

12.3. Exposure estimation and reference to its source

12.3.1. Environmental release and exposure: Formulation into mixture (ERC2) / Formulation (SU 10)

Compartment	Exposure level	RCR
Freshwater	0.181 mg/L (EUSES v2.1)	0.905
Freshwater sediment	0.974 mg/kg dry weight (EUSES v2.1)	0.823
Marine water	0.018 mg/L (EUSES v2.1)	0.09
Marine sediment	0.097 mg/kg dry weight (EUSES v2.1)	0.82
Sewage treatment plant	1.795 mg/L (EUSES v2.1)	0.18
Agricultural soil	0.029 mg/kg dry weight (EUSES v2.1)	0.012
Man via environment - Inhalation	0.00693 mg/m³ (EUSES v2.1)	< 0.01
Man via environment - Oral	0.02 mg/kg bw/day (EUSES v2.1)	< 0.01
Man via environment - combined routes		< 0.01

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.551 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	1.371 mg/kg bw/day (ECETOC TRA worker v3)	0.137
combined routes	systemic	long-term		0.146
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR

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inhalative	systemic	long-term	0.551 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	1.37 mg/kg bw/day (ECETOC TRA worker v3)	0.137
combined routes	systemic	long-term		0.146
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

12.3.4. Worker exposure: Use as laboratory reagent (PROC15) / Quality control of received goods ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	2.753 mg/m³ (ECETOC TRA worker v3)	0.046
dermal	systemic	long-term	0.34 mg/kg bw/day (ECETOC TRA worker v3)	0.034
combined routes	systemic	long-term		0.08
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.011 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	0.034 mg/kg bw/day (ECETOC TRA worker v3)	< 0.01
combined routes	systemic	long-term		< 0.01
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

12.3.6. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Closed system mixing including filling process equipment ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	9.912 mg/m³ (ECETOC TRA worker v3)	0.165
dermal	systemic	long-term	0.69 mg/kg bw/day (ECETOC TRA worker v3)	0.069

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combined routes	systemic	long-term		0.234
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

12.3.7. Worker exposure: Mixing or blending in batch processes (PROC5) / Batch mixing with significant contact including filling process ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	1.652 mg/m³ (ECETOC TRA worker v3)	0.028
dermal	systemic	long-term	1.371 mg/kg bw/day (ECETOC TRA worker v3)	0.137
combined routes	systemic	long-term		0.165
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	3.304 mg/m³ (ECETOC TRA worker v3)	0.055
dermal	systemic	long-term	1.371 mg/kg bw/day (ECETOC TRA worker v3)	0.137
combined routes	systemic	long-term		0.192
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

12.3.9. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Sampling of compounds ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.33 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	0.822 mg/kg bw/day (ECETOC TRA worker v3)	0.082
combined routes	systemic	long-term		0.088
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

12.3.10. Worker exposure: Use as laboratory reagent (PROC15) / Quality control of compounds ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	1.625 mg/m³ (ECETOC TRA worker v3)	0.028
dermal	systemic	long-term	0.204 mg/kg bw/day (ECETOC TRA worker v3)	0.02
combined routes	systemic	long-term		0.048
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

12.3.11. Worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Charging/discharging from/to vessels/large ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.551 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	1.371 mg/kg bw/day (ECETOC TRA worker v3)	0.137
combined routes	systemic	long-term		0.146
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	3.304 mg/m³ (ECETOC TRA worker v3)	0.055
dermal	systemic	long-term	4.116 mg/kg bw/day (ECETOC TRA worker v3)	0.412
combined routes	systemic	long-term		0.467
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

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

Environment
If a DU has OC/RMMs outside specifications in the ES, then the DU can evaluate whether he works inside the boundaries set by the ES through scaling in EUSES.
The main driving parameters are :
- local amount used (tonnage)

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- release factor prior to on-site treatment
- on-site wastewater treatment presence and efficiency
- dilution factor

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Human Health
Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

ES13: Formulation or re-packing, Industrial, Formulation of fragranced end-products (IFRA GES 2)

13.1. Title section

Structured Short Title	:	Formulation or re-packing

Environment		
CS1	**Industrial formulation end-products**	ERC2,
Worker		
CS2	**Uploading/unloading**	PROC8b,
CS3	**Sampling of received goods**	PROC2,
CS4	**Quality control of received goods**	PROC15,
CS5	**Storage**	PROC1,
CS6	**Closed system mixing including filling process equipment**	PROC3,
CS7	**Batch mixing with significant contact including filling process**	PROC5,
CS8	**Maintenance and cleaning**	PROC8a,
CS9	**Sampling of compounds**	PROC2,
CS10	**Quality control of compounds**	PROC15,
CS11	**Charging/discharging from/to vessels/large**	PROC8b,
CS12	**Transfer in a small containers**	PROC9,
CS13	**Production of preparations or articles by tabletting, compression, extrusion, pelletisation**	PROC14

13.2. Conditions of use affecting exposure

13.2.1. Control of environmental exposure: Formulation into mixture (ERC2) / Industrial formulation end-products ()

Amount used, frequency and duration of use (or from service life)		
Daily amount per site	:	<= 1.186 t
Fraction of EU tonnage used in region:	:	100 %
Annual amount per site	:	<= 1190 t
Emission Days (days/year):	:	>= 250
Maximum daily local emission to waste water	:	2.372 kg
Maximum daily local emission to air	:	29.65 kg
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal Sewage Treatment Plant
STP sludge treatment	:	Sewage sludge may be recovered for agricultural or horticultural purposes

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STP effluent	:	2,000 m3/d
STP Water - minimum efficiency of 0.255 %		
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	No specific measures identified.
Other conditions affecting environmental exposure		
Receiving surface water flow	:	18,000 m3/d

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

Product (article) characteristics		
Covers concentrations up to		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 1 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants) Use suitable eye protection.		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 15 min/day

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Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Closed continuous process with occasional controlled exposure Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

13.2.4. Control of worker exposure: Use as laboratory reagent (PROC15) / Quality control of received goods ()

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 15 min/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid

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Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 1 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Use in closed process, no likelihood of exposure Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

13.2.6. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Closed system mixing including filling process equipment ()

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 4 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced. Closed batch process with occasional controlled exposure		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

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13.2.7. Control of worker exposure: Mixing or blending in batch processes (PROC5) / Batch mixing with significant contact including filling process ()

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 4 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants) Use suitable eye protection.		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 4 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants) Use suitable eye protection.		
For further specification, refer to section 8 of the SDS.		

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

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

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 15 min/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Closed continuous process with occasional controlled exposure Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

13.2.10. Control of worker exposure: Use as laboratory reagent (PROC15) / Quality control of compounds ()

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 15 min/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced.		

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Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

13.2.11. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Charging/discharging from/to vessels/large ()

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 1 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants) Use suitable eye protection.		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 1 h/day

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Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

13.2.13. Control of worker exposure: Production of preparations or articles by tabletting, compression, extrusion, pelletisation (PROC14)

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

13.3. Exposure estimation and reference to its source

13.3.1. Environmental release and exposure: Formulation into mixture (ERC2) / Industrial formulation end-products ()

Compartment	**Exposure level**	**RCR**
Freshwater	0.12 mg/L (EUSES v2.1)	0.599

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Freshwater sediment	0.644 mg/kg dry weight (EUSES v2.1)	0.545
Marine water	0.012 mg/L (EUSES v2.1)	0.06
Marine sediment	0.064 mg/kg dry weight (EUSES v2.1)	0.541
Sewage treatment plant	1.183 mg/L (EUSES v2.1)	0.118
Agricultural soil	0.034 mg/kg dry weight (EUSES v2.1)	0.014
Man via environment - Inhalation	0.023 mg/m³ (EUSES v2.1)	< 0.01
Man via environment - Oral	0.063 mg/kg bw/day (EUSES v2.1)	0.013
Man via environment - combined routes		0.014

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.551 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	1.371 mg/kg bw/day (ECETOC TRA worker v3)	0.137
combined routes	systemic	long-term		0.146
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

13.3.3. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Sampling of received goods ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.055 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	0.137 mg/kg bw/day (ECETOC TRA worker v3)	0.014
combined routes	systemic	long-term		0.015
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

13.3.4. Worker exposure: Use as laboratory reagent (PROC15) / Quality control of received goods ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.275 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	0.034 mg/kg bw/day	< 0.01

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			(ECETOC TRA worker v3)	
combined routes	systemic	long-term		< 0.01
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.0011 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	0.0034 mg/kg bw/day (ECETOC TRA worker v3)	< 0.01
combined routes	systemic	long-term		< 0.01
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

13.3.6. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Closed system mixing including filling process equipment ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.991 mg/m³ (ECETOC TRA worker v3)	0.017
dermal	systemic	long-term	0.069 mg/kg bw/day (ECETOC TRA worker v3)	< 0.01
combined routes	systemic	long-term		0.023
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

13.3.7. Worker exposure: Mixing or blending in batch processes (PROC5) / Batch mixing with significant contact including filling process ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	1.652 mg/m³ (ECETOC TRA worker v3)	0.028
dermal	systemic	long-term	1.371 mg/kg bw/day (ECETOC TRA worker v3)	0.137
combined routes	systemic	long-term		0.165
dermal	local	long-term	(Risk management measures are based	

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			on qualitative risk characterisation.)	

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	3.304 mg/m³ (ECETOC TRA worker v3)	0.055
dermal	systemic	long-term	1.371 mg/kg bw/day (ECETOC TRA worker v3)	0.137
combined routes	systemic	long-term		0.192
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

13.3.9. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Sampling of compounds ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.055 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	0.137 mg/kg bw/day (ECETOC TRA worker v3)	0.014
combined routes	systemic	long-term		0.015
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

13.3.10. Worker exposure: Use as laboratory reagent (PROC15) / Quality control of compounds ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.275 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	0.034 mg/kg bw/day (ECETOC TRA worker v3)	< 0.01
combined routes	systemic	long-term		< 0.01
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

13.3.11. Worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Charging/discharging from/to vessels/large ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR

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inhalative	systemic	long-term	0.551 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	1.371 mg/kg bw/day (ECETOC TRA worker v3)	0.137
combined routes	systemic	long-term		0.146
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

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

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.551 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	0.686 mg/kg bw/day (ECETOC TRA worker v3)	0.069
combined routes	systemic	long-term		0.078
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

13.3.13. Worker exposure: Production of preparations or articles by tabletting, compression, extrusion, pelletisation (PROC14)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	2.753 mg/m³ (ECETOC TRA worker v3)	0.046
dermal	systemic	long-term	0.343 mg/kg bw/day (ECETOC TRA worker v3)	0.034
combined routes	systemic	long-term		0.08
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

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

Environment
If a DU has OC/RMMs outside specifications in the ES, then the DU can evaluate whether he works inside the boundaries set by the ES through scaling in EUSES.
The main driving parameters are :
- local amount used (tonnage)
- release factor prior to on-site treatment
- on-site wastewater treatment presence and efficiency
- dilution factor

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Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Human Health
Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

ES14: Formulation or re-packing, Formulation of fragrance compounds (IFRA GES 1)

14.1. Title section

Structured Short Title	:	Formulation or re-packing

Environment		
CS1	**Formulation of fragrance compounds (IFRA GES 1)**	ERC2,
Worker		
CS2	**Material transfers from/to vessel/container at dedicated facility (IFRA F-1)**	PROC8b, CS1
CS3	**Storage (IFRA F-2)**	PROC1, CS2
CS4	**Mixing operations (closed systems) in batch process including filling of equipment and sample collection (IFRA F-3)**	PROC3, CS3
CS5	**Mixing operations (open systems) in batch process including filling of equipment and sample collection (IFRA F-4)**	PROC5, CS4
CS6	**QC laboratory (IFRA F-5)**	PROC15, CS5
CS7	**Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (IFRA F-6)**	PROC9, CS6
CS8	**Equipment cleaning and maintenance (IFRA F-7)**	PROC8a, CS7

14.2. Conditions of use affecting exposure

14.2.1. Control of environmental exposure: Formulation into mixture (ERC2) / Formulation of fragrance compounds (IFRA GES 1) ()

Amount used, frequency and duration of use (or from service life)		
Daily amount per site	:	<= 0.507 t
Annual amount per site	:	<= 507 t
Emission Days (days/year):	:	>= 250
Maximum daily local emission to waste water	:	1.014 kg
Maximum daily local emission to air	:	12.67 kg
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal Sewage Treatment Plant
STP sludge treatment	:	Sewage sludge may be recovered for agricultural or horticultural purposes
STP effluent	:	2,000 m3/d
STP Water - minimum efficiency of 0.255 %		
Conditions and measures related to treatment of waste (including article waste)		

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Waste treatment	:	Particular considerations on the waste treatment operations

14.2.2. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Material transfers from/to vessel/container at dedicated facility (IFRA F-1) (CS1)

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 1 h/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Use suitable eye protection.		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

14.2.3. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) / Storage (IFRA F-2) (CS2)

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 1 h/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Use suitable eye protection.		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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Temperature	:	Assumes process temperature up to 40 °C

14.2.4. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Mixing operations (closed systems) in batch process including filling of equipment and sample collection (IFRA F-3) (CS3)

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 4 h/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Use suitable eye protection.		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

14.2.5. Control of worker exposure: Mixing or blending in batch processes (PROC5) / Mixing operations (open systems) in batch process including filling of equipment and sample collection (IFRA F-4) (CS4)

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 4 h/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Use suitable eye protection.		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		

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Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

14.2.6. Control of worker exposure: Use as laboratory reagent (PROC15) / QC laboratory (IFRA F-5) (CS5)

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 15 min/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

14.2.7. Control of worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (IFRA F-6) (CS6)

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 1 h/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Use suitable eye protection.		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		

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Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

14.2.8. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Equipment cleaning and maintenance (IFRA F-7) (CS7)

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 4 h/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Advanced.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Use suitable eye protection.		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

14.3. Exposure estimation and reference to its source

14.3.1. Environmental release and exposure: Formulation into mixture (ERC2) / Formulation of fragrance compounds (IFRA GES 1) ()

Compartment	Exposure level	RCR
Freshwater	0.052 mg/L (EUSES v2.1)	0.26
Freshwater sediment	0.28 mg/kg dry weight (EUSES v2.1)	0.237
Marine water	0.00514 mg/L (EUSES v2.1)	0.026
Marine sediment	0.028 mg/kg dry weight (EUSES v2.1)	0.233
Sewage treatment plant	0.506 mg/L (EUSES v2.1)	0.051
Agricultural soil	0.02 mg/kg dry weight (EUSES v2.1)	< 0.01
Man via environment - Inhalation	0.00973 mg/m³ (EUSES v2.1)	< 0.01
Man via environment - Oral	0.027 mg/kg bw/day (EUSES v2.1)	< 0.01
Man via environment - combined routes		< 0.01

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14.3.2. Worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Material transfers from/to vessel/container at dedicated facility (IFRA F-1) (CS1)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.551 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	1.371 mg/kg bw/day (ECETOC TRA worker v3)	0.137
combined routes	systemic	long-term		0.146
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

14.3.3. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) / Storage (IFRA F-2) (CS2)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.001 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	0.0034 mg/kg bw/day (ECETOC TRA worker v3)	< 0.01
combined routes	systemic	long-term		< 0.01
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

14.3.4. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Mixing operations (closed systems) in batch process including filling of equipment and sample collection (IFRA F-3) (CS3)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.991 mg/m³ (ECETOC TRA worker v3)	0.017
dermal	systemic	long-term	0.069 mg/kg bw/day (ECETOC TRA worker v3)	< 0.01
combined routes	systemic	long-term		0.023
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

14.3.5. Worker exposure: Mixing or blending in batch processes (PROC5) / Mixing operations (open systems) in batch process including filling of equipment and sample collection (IFRA F-4) (CS4)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	1.652 mg/m³ (ECETOC TRA	0.028

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			worker v3)	
dermal	systemic	long-term	1.371 mg/kg bw/day (ECETOC TRA worker v3)	0.137
combined routes	systemic	long-term		0.165
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

14.3.6. Worker exposure: Use as laboratory reagent (PROC15) / QC laboratory (IFRA F-5) (CS5)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.275 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	0.034 mg/kg bw/day (ECETOC TRA worker v3)	< 0.01
combined routes	systemic	long-term		< 0.01
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

14.3.7. Worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (IFRA F-6) (CS6)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.551 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	0.686 mg/kg bw/day (ECETOC TRA worker v3)	0.069
combined routes	systemic	long-term		0.078
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

14.3.8. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Equipment cleaning and maintenance (IFRA F-7) (CS7)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	3.304 mg/m³ (ECETOC TRA worker v3)	0.055
dermal	systemic	long-term	1.371 mg/kg bw/day (ECETOC TRA worker v3)	0.137
combined routes	systemic	long-term		0.192

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dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

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

Environment
If a DU has OC/RMMs outside specifications in the ES, then the DU can evaluate whether he works inside the boundaries set by the ES through scaling in EUSES.
The main driving parameters are :
- local amount used (tonnage)
- release factor prior to on-site treatment
- on-site wastewater treatment presence and efficiency
- dilution factor

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Human Health
Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

ES15: Widespread use by professional workers, Professional uses, end-products

15.1. Title section

Structured Short Title	:	Widespread use by professional workers

Environment		
CS1	**Professional end-use of washing and cleaning products (IFRA GES 4)**	ERC8d,
Worker		
CS2	**The use as fragrance solvent in various products (detergents, laundry products, dishwash products, kitchen cleaners, medical devices)**	PROC8a,
CS3	**Use of detergent and conditioners**	PROC8a,
CS4	**The use as fragrance solvent in various products (general purpose cleaners, laundry products, floor and carpet cleaners)**	PROC8a,
CS5	**The use as fragrance solvent in various products (laundry products, dishwash products, kitchen and drain cleaners)**	PROC8a,
CS6	**Prespotter/stain remover**	PROC11,
CS7	**Dishwash products (Use phase)**	PROC10,
CS8	**Dishwash and rinse products (Preparatory phase)**	PROC8b,
CS9	**Dishwash and rinse products (Use phase)**	PROC2,
CS10	**The use as fragrance solvent in various products**	PROC10,
CS11	**General purpose cleaner, spray and wipe (Use phase)**	PROC11,
CS12	**Kitchen cleaners (Use phase)**	PROC10,
CS13	**The use as fragrance solvent in various products**	PROC11,
CS14	**Descaling agent**	PROC13,
CS15	**Oven, grill cleaner**	PROC10,
CS16	**Floor cleaners (Preparatory phase)**	PROC8a,
CS17	**Floor cleaners, spray and wipe (Use phase)**	PROC11,
CS18	**The use as fragrance solvent in various products**	PROC8a,
CS19	**Car wash and dewaxing products (Use phase)**	PROC4,
CS20	**Spray and rinse process (Use phase)**	PROC11,
CS21	**Boat cleaners (Use process)**	PROC10,
CS22	**Surface cleaner: high and medium pressure (Preparatory phase)**	PROC8a,
CS23	**Surface cleaner: high and medium pressure (Use phase)**	PROC11,
CS24	**Medical devices (Preparatory process)**	PROC8a,
CS25	**Medical devices (Use phase)**	PROC4,
CS26	**Medical devices: dipping process (Preparatory process)**	PROC8a,
CS27	**Medical devices: dipping process (Use phase)**	PROC13,
CS28	**The use as fragrance solvent in various products**	PROC11,

15.2. Conditions of use affecting exposure

15.2.1. Control of environmental exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) (ERC8d) / Professional end-use of washing and cleaning products (IFRA GES 4) ()

Amount used, frequency and duration of use (or from service life)		
Fraction of EU tonnage used in region:	:	10 %
Daily amount for wide disperse uses	:	0.198 kg
Maximum daily local emission to waste water	:	0.198 kg
Conditions and measures related to sewage treatment plant		
STP Water - minimum efficiency of 0.255 %		
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	No specific measures identified.

15.2.2. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / The use as fragrance solvent in various products (detergents, laundry products, dishwash products, kitchen cleaners, medical devices) ()

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 15 min/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Basic.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants) Use suitable eye protection.		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

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15.2.3. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Use of detergent and conditioners ()

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Basic.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants) Use suitable eye protection.		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

15.2.4. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / The use as fragrance solvent in various products (general purpose cleaners, laundry products, floor and carpet cleaners) ()

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 1 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Basic.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants) Use suitable eye protection.		
Wear suitable gloves tested to EN374.		

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Dermal - minimum efficiency of >= 80 %		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

15.2.5. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / The use as fragrance solvent in various products (laundry products, dishwash products, kitchen and drain cleaners) ()

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 15 min/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Basic.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants) Use suitable eye protection.		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

15.2.6. Control of worker exposure: Non-industrial spraying (PROC11) / Prespotter/stain remover ()

Product (article) characteristics		
Covers concentrations up to 15 %		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 1 h/day
Very low application rate (< 0.03 l/minute)		
Technical and organisational conditions and measures		

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Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Basic.
Conditions and measures related to personal protection, hygiene and health evaluation
General measures (eye irritants)
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of >= 90 %
For further specification, refer to section 8 of the SDS.
Other conditions affecting workers exposure

Indoor or outdoor use	:	Indoor use
Room size	:	Any size workroom
Temperature	:	Assumes process temperature up to 25 °C
Distance from the worker to the emission source < 1 m		

15.2.7. Control of worker exposure: Roller application or brushing (PROC10) / Dishwash products (Use phase) ()

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Basic.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants) Use suitable eye protection.		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

15.2.8. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Dishwash and rinse products (Preparatory phase) ()

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Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 15 min/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Basic.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants) Use suitable eye protection.		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

15.2.9. Control of worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Dishwash and rinse products (Use phase) ()

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 15 min/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Closed continuous process with occasional controlled exposure Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Basic.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
For further specification, refer to section 8 of the SDS.		

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

15.2.10. Control of worker exposure: Roller application or brushing (PROC10) / The use as fragrance solvent in various products ()

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Basic.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants) Use suitable eye protection.		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

15.2.11. Control of worker exposure: Non-industrial spraying (PROC11) / General purpose cleaner, spray and wipe (Use phase) ()

Product (article) characteristics		
Covers concentrations up to 15 %		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 15 min/day
Low application rate (0.03 - 0.3 l/minute)		
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing.		

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Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Basic.
Conditions and measures related to personal protection, hygiene and health evaluation
General measures (eye irritants)
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of >= 90 %
For further specification, refer to section 8 of the SDS.
Other conditions affecting workers exposure

Indoor or outdoor use	:	Indoor use
Room size	:	Any size workroom
Temperature	:	Assumes process temperature up to 25 °C
Distance from the worker to the emission source < 1 m		

15.2.12. Control of worker exposure: Roller application or brushing (PROC10) / Kitchen cleaners (Use phase) ()

Product (article) characteristics		
Covers concentrations up to 15 %		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Scale of application for spreading of liquid to surface	:	> 3 m2/h
Use frequency	:	Duration of the activity 4 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Basic.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants) Use suitable eye protection.		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Room size	:	Any size workroom
Temperature	:	Assumes process temperature up to 25 °C
Distance from the worker to the emission source < 1 m		

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15.2.13. Control of worker exposure: Non-industrial spraying (PROC11) / The use as fragrance solvent in various products ()

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 15 min/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Basic.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of >= 80 %		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

15.2.14. Control of worker exposure: Treatment of articles by dipping and pouring (PROC13) / Descaling agent ()

Product (article) characteristics		
Covers concentrations up to 15 %		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 1 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Basic.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants) Use suitable eye protection.		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %		

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For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

15.2.15. Control of worker exposure: Roller application or brushing (PROC10) / Oven, grill cleaner ()

Product (article) characteristics		
Covers concentrations up to 15 %		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 1 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Basic.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants) Use suitable eye protection.		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

15.2.16. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Floor cleaners (Preparatory phase) ()

Product (article) characteristics		
Covers concentrations up to 15 %		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 1 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands.		

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Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Basic.
Conditions and measures related to personal protection, hygiene and health evaluation
General measures (eye irritants) Use suitable eye protection.
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %
For further specification, refer to section 8 of the SDS.
Other conditions affecting workers exposure

Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

15.2.17. Control of worker exposure: Non-industrial spraying (PROC11) / Floor cleaners, spray and wipe (Use phase) ()

Product (article) characteristics
Covers concentrations up to 15 %

Physical form of product	:	Liquid

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

Use frequency	:	Duration of the activity 1 h/day

Low application rate (0.03 - 0.3 l/minute)
Technical and organisational conditions and measures
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Basic. Segregation of the source: No segregation
Conditions and measures related to personal protection, hygiene and health evaluation
General measures (eye irritants)
Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training. Dermal - minimum efficiency of >= 90 %
For further specification, refer to section 8 of the SDS.
Other conditions affecting workers exposure

Indoor or outdoor use	:	Indoor use
Room size	:	Any size workroom
Temperature	:	Assumes process temperature up to 25 °C

15.2.18. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / The use as fragrance solvent in various products ()

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 1 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Occupational Health and Safety Management System: Basic.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants) Use suitable eye protection.		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Outdoor use
Temperature	:	Assumes process temperature up to 40 °C

15.2.19. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4) / Car wash and dewaxing products (Use phase) ()

Product (article) characteristics		
Covers concentrations up to 15 %		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Occupational Health and Safety Management System: Basic.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants) Use suitable eye protection.		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		

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Indoor or outdoor use	:	Outdoor use
Temperature	:	Assumes process temperature up to 40 °C

15.2.20. Control of worker exposure: Non-industrial spraying (PROC11) / Spray and rinse process (Use phase) ()

Product (article) characteristics		
Covers concentrations up to 15 %		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 1 h/day
Moderate application rate (0.3 - 3 l/minute)		
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Occupational Health and Safety Management System: Basic. No containment		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of >= 90 %		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Outdoor use
Temperature	:	Assumes process temperature up to 25 °C
Distance from the worker to the emission source < 1 m		

15.2.21. Control of worker exposure: Roller application or brushing (PROC10) / Boat cleaners (Use process) ()

Product (article) characteristics		
Covers concentrations up to 15 %		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Scale of application for spreading of liquid to surface	:	> 3 m2/h
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing.		

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Occupational Health and Safety Management System: Basic.
Conditions and measures related to personal protection, hygiene and health evaluation
General measures (eye irritants) Use suitable eye protection.
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %
For further specification, refer to section 8 of the SDS.
Other conditions affecting workers exposure

Indoor or outdoor use	:	Outdoor use
Temperature	:	Assumes process temperature up to 25 °C
Distance from the worker to the emission source < 1 m		

15.2.22. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Surface cleaner: high and medium pressure (Preparatory phase) ()

Product (article) characteristics		
Covers concentrations up to 15 %		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 0.25 min/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Occupational Health and Safety Management System: Basic.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants) Use suitable eye protection.		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Outdoor use
Temperature	:	Assumes process temperature up to 40 °C

15.2.23. Control of worker exposure: Non-industrial spraying (PROC11) / Surface cleaner: high and medium pressure (Use phase) ()

Product (article) characteristics
Covers concentrations up to 15 %

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Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Duration	:	Covers daily exposures up to 8 hours
Moderate application rate (0.3 - 3 l/minute)		
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Occupational Health and Safety Management System: Basic.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %		
Wear suitable respiratory protection. Dermal - minimum efficiency of >= 90 %		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Outdoor use
Temperature	:	Assumes process temperature up to 40 °C

15.2.24. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Medical devices (Preparatory process) ()

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 1 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Basic.		
Local exhaust ventilation Dermal - minimum efficiency of 80 % Inhalation - minimum efficiency of 80 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants) Use suitable eye protection.		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %		
For further specification, refer to section 8 of the SDS.		

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

15.2.25. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4) / Medical devices (Use phase) ()

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 4 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Basic.		
Local exhaust ventilation Dermal - minimum efficiency of 80 % Inhalation - minimum efficiency of 80 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants) Use suitable eye protection.		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

15.2.26. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Medical devices: dipping process (Preparatory process) ()

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 15 min/day

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Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Basic.		
Local exhaust ventilation Dermal - minimum efficiency of 80 % Inhalation - minimum efficiency of 80 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants) Use suitable eye protection.		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

15.2.27. Control of worker exposure: Treatment of articles by dipping and pouring (PROC13) / Medical devices: dipping process (Use phase) ()

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 4 h/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Basic.		
Local exhaust ventilation Dermal - minimum efficiency of 80 % Inhalation - minimum efficiency of 80 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants) Use suitable eye protection.		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use

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Temperature	:	Assumes process temperature up to 40 °C

15.2.28. Control of worker exposure: Non-industrial spraying (PROC11) / The use as fragrance solvent in various products ()

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Duration of the activity 15 min/day
Technical and organisational conditions and measures		
Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Occupational Health and Safety Management System: Basic.		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (eye irritants)		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

15.3. Exposure estimation and reference to its source

15.3.1. Environmental release and exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) (ERC8d) / Professional end-use of washing and cleaning products (IFRA GES 4) ()

Compartment	Exposure level	RCR
Freshwater	0.011 mg/L (EUSES v2.1)	0.057
Freshwater sediment	0.061 mg/kg dry weight (EUSES v2.1)	0.052
Marine water	0.00107 mg/L (EUSES v2.1)	< 0.01
Marine sediment	0.00573 mg/kg dry weight (EUSES v2.1)	0.048
Sewage treatment plant	0.099 mg/L (EUSES v2.1)	< 0.01
Agricultural soil	0.00974 mg/kg dry weight (EUSES v2.1)	< 0.01
Man via environment - Inhalation	0.0000759 mg/m³ (EUSES v2.1)	< 0.01
Man via environment - Oral	0.000885 mg/kg bw/day (EUSES	< 0.01

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	v2.1)	
Man via environment - combined routes		< 0.01

15.3.2. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / The use as fragrance solvent in various products (detergents, laundry products, dishwash products, kitchen cleaners, medical devices) ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	1.377 mg/m³ (ECETOC TRA worker v3)	0.023
dermal	systemic	long-term	0.274 mg/kg bw/day (ECETOC TRA worker v3)	0.027
combined routes	systemic	long-term		0.05
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

15.3.3. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Use of detergent and conditioners ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	13.76 mg/m³ (ECETOC TRA worker v3)	0.229
dermal	systemic	long-term	1.371 mg/kg bw/day (ECETOC TRA worker v3)	0.137
combined routes	systemic	long-term		0.367
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

15.3.4. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / The use as fragrance solvent in various products (general purpose cleaners, laundry products, floor and carpet cleaners) ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	2.753 mg/m³ (ECETOC TRA worker v3)	0.046
dermal	systemic	long-term	0.274 mg/kg bw/day (ECETOC TRA worker v3)	0.027
combined routes	systemic	long-term		0.073
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

15.3.5. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / The use as fragrance solvent in various products (laundry products, dishwash products, kitchen and drain cleaners) ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	1.377 mg/m³ (ECETOC TRA worker v3)	0.023
dermal	systemic	long-term	1.371 mg/kg bw/day (ECETOC TRA worker v3)	0.137
combined routes	systemic	long-term		0.16
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

15.3.6. Worker exposure: Non-industrial spraying (PROC11) / Prespotter/stain remover ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	4.3 mg/m³ (ART v1.5)	0.072
dermal	systemic	long-term	6.428 mg/kg bw/day (ECETOC TRA worker v3)	0.643
combined routes	systemic	long-term		0.715
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

15.3.7. Worker exposure: Roller application or brushing (PROC10) / Dishwash products (Use phase) ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	13.76 mg/m³ (ECETOC TRA worker v3)	0.229
dermal	systemic	long-term	0.549 mg/kg bw/day (ECETOC TRA worker v3)	0.055
combined routes	systemic	long-term		0.284
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

15.3.8. Worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Dishwash and rinse products (Preparatory phase) ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.551 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	0.274 mg/kg bw/day (ECETOC TRA worker v3)	0.027

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combined routes	systemic	long-term		0.037
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

15.3.9. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Dishwash and rinse products (Use phase) ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.275 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	0.137 mg/kg bw/day (ECETOC TRA worker v3)	0.014
combined routes	systemic	long-term		0.018
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

15.3.10. Worker exposure: Roller application or brushing (PROC10) / The use as fragrance solvent in various products ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	13.76 mg/m³ (ECETOC TRA worker v3)	0.229
dermal	systemic	long-term	2.743 mg/kg bw/day (ECETOC TRA worker v3)	0.274
combined routes	systemic	long-term		0.504
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

15.3.11. Worker exposure: Non-industrial spraying (PROC11) / General purpose cleaner, spray and wipe (Use phase) ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	3.2 mg/m³ (ART v1.5)	0.053
dermal	systemic	long-term	6.428 mg/kg bw/day (ECETOC TRA worker v3)	0.643
combined routes	systemic	long-term		0.696
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

15.3.12. Worker exposure: Roller application or brushing (PROC10) / Kitchen cleaners (Use phase) ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR

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inhalative	systemic	long-term	17 mg/m³ (ART v1.5)	0.283
dermal	systemic	long-term	3.292 mg/kg bw/day (ECETOC TRA worker v3)	0.329
combined routes	systemic	long-term		0.612
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

15.3.13. Worker exposure: Non-industrial spraying (PROC11) / The use as fragrance solvent in various products ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	5.507 mg/m³ (ECETOC TRA worker v3)	0.092
dermal	systemic	long-term	2.143 mg/kg bw/day (ECETOC TRA worker v3)	0.214
combined routes	systemic	long-term		0.306
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

15.3.14. Worker exposure: Treatment of articles by dipping and pouring (PROC13) / Descaling agent ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	6.608 mg/m³ (ECETOC TRA worker v3)	0.11
dermal	systemic	long-term	1.645 mg/kg bw/day (ECETOC TRA worker v3)	0.165
combined routes	systemic	long-term		0.275
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

15.3.15. Worker exposure: Roller application or brushing (PROC10) / Oven, grill cleaner ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	16.52 mg/m³ (ECETOC TRA worker v3)	0.275
dermal	systemic	long-term	3.292 mg/kg bw/day (ECETOC TRA worker v3)	0.329
combined routes	systemic	long-term		0.604
dermal	local	long-term	(Risk management measures are based on qualitative risk	

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			characterisation.)	

15.3.16. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Floor cleaners (Preparatory phase) ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	16.52 mg/m³ (ECETOC TRA worker v3)	0.275
dermal	systemic	long-term	1.645 mg/kg bw/day (ECETOC TRA worker v3)	0.165
combined routes	systemic	long-term		0.44
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

15.3.17. Worker exposure: Non-industrial spraying (PROC11) / Floor cleaners, spray and wipe (Use phase) ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	1.1 mg/m³ (ART v1.5)	0.018
dermal	systemic	long-term	6.428 mg/kg bw/day (ECETOC TRA worker v3)	0.643
combined routes	systemic	long-term		0.661
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

15.3.18. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / The use as fragrance solvent in various products ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	1.927 mg/m³ (ECETOC TRA worker v3)	0.032
dermal	systemic	long-term	0.274 mg/kg bw/day (ECETOC TRA worker v3)	0.027
combined routes	systemic	long-term		0.06
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

15.3.19. Worker exposure: Chemical production where opportunity for exposure arises (PROC4) / Car wash and dewaxing products (Use phase) ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	23.12 mg/m³ (ECETOC TRA worker v3)	0.385

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dermal	systemic	long-term	0.823 mg/kg bw/day (ECETOC TRA worker v3)	0.082
combined routes	systemic	long-term		0.468
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

15.3.20. Worker exposure: Non-industrial spraying (PROC11) / Spray and rinse process (Use phase) ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	4.9 mg/m³ (ART v1.5)	0.082
dermal	systemic	long-term	6.428 mg/kg bw/day (ECETOC TRA worker v3)	0.643
combined routes	systemic	long-term		0.725
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

15.3.21. Worker exposure: Roller application or brushing (PROC10) / Boat cleaners (Use process) ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	3.9 mg/m³ (ART v1.5)	0.065
dermal	systemic	long-term	3.292 mg/kg bw/day (ECETOC TRA worker v3)	0.329
combined routes	systemic	long-term		0.394
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

15.3.22. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Surface cleaner: high and medium pressure (Preparatory phase) ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	5.782 mg/m³ (ECETOC TRA worker v3)	0.096
dermal	systemic	long-term	1.645 mg/kg bw/day (ECETOC TRA worker v3)	0.165
combined routes	systemic	long-term		0.261
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

15.3.23. Worker exposure: Non-industrial spraying (PROC11) / Surface cleaner: high and medium pressure (Use phase) ()

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Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	23.12 mg/m³ (ECETOC TRA worker v3)	0.385
dermal	systemic	long-term	3.275 mg/kg bw/day (RISKOFDERM v2.1)	0.328
combined routes	systemic	long-term		0.713
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

15.3.24. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Medical devices (Preparatory process) ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.551 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	0.055 mg/kg bw/day (ECETOC TRA worker v3)	< 0.01
combined routes	systemic	long-term		0.015
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

15.3.25. Worker exposure: Chemical production where opportunity for exposure arises (PROC4) / Medical devices (Use phase) ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.661 mg/m³ (ECETOC TRA worker v3)	0.011
dermal	systemic	long-term	0.027 mg/kg bw/day (ECETOC TRA worker v3)	< 0.01
combined routes	systemic	long-term		0.014
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

15.3.26. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Medical devices: dipping process (Preparatory process) ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.275 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	long-term	0.055 mg/kg bw/day (ECETOC TRA worker v3)	< 0.01

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combined routes	systemic	long-term		0.01
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

15.3.27. Worker exposure: Treatment of articles by dipping and pouring (PROC13) / Medical devices: dipping process (Use phase) ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	0.661 mg/m³ (ECETOC TRA worker v3)	0.011
dermal	systemic	long-term	0.055 mg/kg bw/day (ECETOC TRA worker v3)	< 0.01
combined routes	systemic	long-term		0.016
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

15.3.28. Worker exposure: Non-industrial spraying (PROC11) / The use as fragrance solvent in various products ()

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
inhalative	systemic	long-term	5.507 mg/m³ (ECETOC TRA worker v3)	0.092
dermal	systemic	long-term	2.143 mg/kg bw/day (ECETOC TRA worker v3)	0.214
combined routes	systemic	long-term		0.306
dermal	local	long-term	(Risk management measures are based on qualitative risk characterisation.)	

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

Environment
If a DU has OC/RMMs outside specifications in the ES, then the DU can evaluate whether he works inside the boundaries set by the ES through scaling in EUSES.
The main driving parameters are :
- local amount used (tonnage)
- release factor prior to on-site treatment
- on-site wastewater treatment presence and efficiency
- dilution factor

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Human Health
Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

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ES16: Consumer use, End use of cosmetic products

16.1. Title section

Structured Short Title	:	Consumer use

Environment		
CS1	**End use of cosmetic products**	ERC8a,
Consumer		
CS2	**End use of cosmetic products**	PC39,
CS3	**End use of cosmetic products**	PC28,

16.2. Conditions of use affecting exposure

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

Amount used, frequency and duration of use (or from service life)		
Fraction of EU tonnage used in region:	:	10 %
Daily amount for wide disperse uses	:	<= 0.198 kg
Maximum daily local emission to waste water	:	0.198 kg
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	No specific measures identified.

16.2.2. Control of consumer exposure: Cosmetics, personal care products (PC39) / End use of cosmetic products ()

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	No spray
Amount used, frequency and duration of use (or from service life)		
Exposure frequency	:	1 events/day
Use frequency	:	Frequent
Other conditions affecting consumers exposure		
Indoor or outdoor use	:	Indoor use

16.2.3. Control of consumer exposure: Perfumes, fragrances (PC28) / End use of cosmetic products ()

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Amount used, frequency and duration of use (or from service life)		
Exposure frequency	:	1 events/day
Use frequency	:	Frequent
Other conditions affecting consumers exposure		
Indoor or outdoor use	:	Indoor use

16.3. Exposure estimation and reference to its source

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

Compartment	Exposure level	RCR
Freshwater	0.011 mg/L (EUSES v2.1)	0.057
Freshwater sediment	0.061 mg/kg dry weight (EUSES v2.1)	0.052
Marine water	0.00107 mg/L (EUSES v2.1)	< 0.01
Marine sediment	0.00573 mg/kg dry weight (EUSES v2.1)	0.048
Sewage treatment plant	0.099 mg/L (EUSES v2.1)	< 0.01
Agricultural soil	0.00974 mg/kg dry weight (EUSES v2.1)	< 0.01
Man via environment - Inhalation	0.0000759 mg/m³ (EUSES v2.1)	< 0.01
Man via environment - Oral	0.000885 mg/kg bw/day (EUSES v2.1)	< 0.01
Man via environment - combined routes		< 0.01

16.3.2. Consumer exposure: Cosmetics, personal care products (PC39) / End use of cosmetic products ()

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

16.3.3. Consumer exposure: Perfumes, fragrances (PC28) / End use of cosmetic products ()

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

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

Environment
If a DU has OC/RMMs outside specifications in the ES, then the DU can evaluate whether he works inside the boundaries set by the ES through scaling in EUSES.
The main driving parameters are :
- local amount used (tonnage)
- release factor prior to on-site treatment
- on-site wastewater treatment presence and efficiency
- dilution factor

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Human Health
Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.