*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 transitio*SAFETY DATA SHEET
Transition document following UK exit from the EU

*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
- 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**

Supplies For Candles Ltd
Unit E, Swinton Bridge Industrial Estate
White Lea Road
Swinton
South Yorkshire
S64 8BH

customerservice@suppliesforcandles.co.uk

01709 257151

## 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**



- Quickly move the person away from the contaminated area. Make the affected person rest.
- Obtain medical attention.

**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.

**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.
- Always obtain medical advice, even if there are no symptoms.

**In case of ingestion**

- Do NOT induce vomiting.

- Obtain medical attention.
- Do not give anything to drink.

### 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 ($CO_2$)
- 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.

## 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.

- 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.
- 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.

**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

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**

- 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

No data available

**Acute toxicity (other routes of administration)**

**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

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**

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

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

**Biodegradability**
No data available

**Physical- and photo-chemical elimination**

**Biodegradation**

2,2-dimethyl-1,3-dioxolan-4-ylmethanol Ready biodegradability study:
Method: OECD Test Guideline 301 F

86.2 % - 28 Days

The 10 day time window criterion is fulfilled.
The substance fulfills the criteria for ultimate aerobic biodegradability and ready biodegradability
Theoretical oxygen demand
Inoculum: activated sludge
Unpublished internal 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 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 accumulation in organisms is not expected.
Due to the distribution coefficient n-octanol/water,

**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** **assessment** No data available

**12.5 Results of PBT and vPvB**

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 |
| 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
- 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

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 :**
211

**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 | 0.000747 mg/L (EUSES v2.1) | < 0.01 |
| Freshwater sediment | 0.00402 mg/kg dry weight (EUSES v2.1) | < 0.01 |
| Marine water | 0.000056 mg/L (EUSES v2.1) | < 0.01 |
| Marine sediment | 0.000301 mg/kg dry weight (EUSES v2.1) | < 0.01 |
| Sewage treatment plant | 0.00209 mg/L (EUSES v2.1) | < 0.01 |
| Agricultural soil | 0.00581 mg/kg dry weight (EUSES v2.1) | < 0.01 |
| Man via environment - Inhalation | 0.0000775 mg/m³ (EUSES v2.1) | < 0.01 |
| Man via environment - Oral | 0.0006 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 |
| 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 | 0.00109 mg/L (EUSES v2.1) | < 0.01 |
| Freshwater sediment | 0.00589 mg/kg dry weight (EUSES v2.1) | < 0.01 |
| Marine water | 0.0000907 mg/L (EUSES v2.1) | < 0.01 |
| Marine sediment | 0.000488 mg/kg dry weight (EUSES v2.1) | < 0.01 |
| Sewage treatment plant | 0.00556 mg/L (EUSES v2.1) | < 0.01 |
| Agricultural soil | 0.00594 mg/kg dry weight (EUSES v2.1) | < 0.01 |
| Man via environment - Inhalation | 0.0000775 mg/m³ (EUSES v2.1) | < 0.01 |
| Man via environment - Oral | 0.000603 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 |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| 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,** PROC3, **grease manufacture)** |
| **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 : 1.269 kg |

| |
|---|
| water |
| Maximum daily local emission to air : 317.2 kg |
| **Conditions and measures related to sewage treatment plant** |

| |
|---|
| STP type : Biological Sewage Treatment Plant<br>STP sludge treatment : Sewage sludge may be recovered for agricultural or horticultural purposes<br>STP effluent : 2,000 m3/d |
| STP<br>Water - minimum efficiency of 87.36 % |
| **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)**

| |
|---|
| **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.<br>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 |

| |
|---|
| 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.<br>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<br>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.<br>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<br>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. |

| Conditions and measures related to personal protection, hygiene and health evaluation |
|---|
| General measures (eye irritants) |
| Wear suitable gloves tested to EN374.<br>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<br>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.<br>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 |

| |
|---|
| **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<br>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.<br>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<br>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<br>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.<br>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<br>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.<br>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)** |

| |
|---|
| 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<br>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.<br>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<br>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.<br>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 |

**3.2.14. 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.<br>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. |

| |
|---|
| 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 | 0.00856 mg/L (EUSES v2.1) | 0.043 |
| Freshwater sediment | 0.046 mg/kg dry weight (EUSES v2.1) | 0.039 |
| Marine water | 0.000837 mg/L (EUSES v2.1) | 0.042 |
| Marine sediment | 0.0045 mg/kg dry weight (EUSES v2.1) | 0.038 |
| Sewage treatment plant | 0.08 mg/L (EUSES v2.1) | < 0.01 |
| Agricultural soil | 0.013 mg/kg dry weight (EUSES v2.1) | < 0.01 |
| Man via environment - Inhalation | 0.024 mg/m³ (EUSES v2.1) | < 0.01 |
| Man via environment - Oral | 0.057 mg/kg bw/day (EUSES v2.1) | 0.011 |
| 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 |
| 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 |
| 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 |
| dermal | systemic | long-term | 0.138 mg/kg bw/day (ECETOC TRA worker v3) | 0.014 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 | 0.274 |

| | | | | |
|---|---|---|---|---|
| | | | (ECETOC TRA worker v3) | |
| 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 |
| 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 |
|---|---|---|---|---|
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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.

**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<br>Water - minimum efficiency of 87.36 % |
| **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 ()**

| |
|---|
| **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.

| |
|---|
| **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** |

| |
|---|
| 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 ()**

| |
|---|
| **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** |

| |
|---|
| General measures (eye irritants) |
| Use suitable eye protection. |
| Wear suitable gloves tested to EN374.<br>Dermal - minimum efficiency of >= 80 % |
| Wear suitable respiratory protection.<br>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 | 0.00148 mg/L (EUSES v2.1) | < 0.01 |
| Freshwater sediment | 0.00798 mg/kg dry weight (EUSES v2.1) | < 0.01 |
| Marine water | 0.00013 mg/L (EUSES v2.1) | < 0.01 |
| Marine sediment | 0.000697 mg/kg dry weight (EUSES v2.1) | < 0.01 |
| Sewage treatment plant | 0.00945 mg/L (EUSES v2.1) | < 0.01 |
| Agricultural soil | 0.00609 mg/kg dry weight (EUSES v2.1) | < 0.01 |
| Man via environment - Inhalation | 0.0000775 mg/m³ (EUSES v2.1) | < 0.01 |
| Man via environment - Oral | 0.000607 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 |
| dermal | systemic | long-term | 2.743 mg/kg bw/day (ECETOC TRA worker v3) | 0.274 |
| 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 | Exposure level | RCR |
|---|---|---|---|---|

| | | indicator | | |
|---|---|---|---|---|
| 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 |
| 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 |
| 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 |
| combined routes | systemic | long-term | | 0.247 |

**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 |
| 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 |
| 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 |
| 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 |
| dermal | systemic | long-term | 2.743 mg/kg bw/day (ECETOC TRA worker v3) | 0.274 |
| 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 |
| 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<br>Water - minimum efficiency of 87.36 % |
| **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 |

| 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.<br>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 | 0.00179 mg/L (EUSES v2.1) | < 0.01 |
| Freshwater sediment | 0.00962 mg/kg dry weight (EUSES v2.1) | < 0.01 |

| | | |
|---|---|---|
| Marine water | 0.00016 mg/L (EUSES v2.1) | < 0.01 |
| Marine sediment | 0.000862 mg/kg dry weight (EUSES v2.1) | < 0.01 |
| Sewage treatment plant | 0.013 mg/L (EUSES v2.1) | < 0.01 |
| Agricultural soil | 0.0062 mg/kg dry weight (EUSES v2.1) | < 0.01 |
| Man via environment - Inhalation | 0.0000775 mg/m³ (EUSES v2.1) | < 0.01 |
| Man via environment - Oral | 0.00061 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 |
| dermal | systemic | long-term | 1.097 mg/kg bw/day | 0.11 |
| | | | (ECETOC TRA worker v3) | |
| 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.

**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 : 0.118 kg |

| |
|---|
| water |
| **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 |

| |
|---|
| 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<br>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 <= 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 ()**

| **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** |

| |
|---|
| 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 | 0.00129 mg/L (EUSES v2.1) | < 0.01 |
| Freshwater sediment | 0.00691 mg/kg dry weight (EUSES v2.1) | < 0.01 |
| Marine water | 0.00011 mg/L (EUSES v2.1) | < 0.01 |
| Marine sediment | 0.000591 mg/kg dry weight (EUSES v2.1) | < 0.01 |
| Sewage treatment plant | 0.00747 mg/L (EUSES v2.1) | < 0.01 |
| Agricultural soil | 0.00601 mg/kg dry weight (EUSES v2.1) | < 0.01 |
| Man via environment - Inhalation | 0.0000775 mg/m³ (EUSES v2.1) | < 0.01 |
| Man via environment - Oral | 0.000605 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 1.1.0) | < 0.01 |
| 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 | 0.343 |
| | | | consumer v3) | |
| dermal | systemic | long-term | 1.429 mg/kg bw/day (ECETOC TRA consumer v3) | 0.286 |
| 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 | Exposure level | RCR |
|---|---|---|---|---|

| | | indicator | | |
|---|---|---|---|---|
| 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.

**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)** PC3_1, **Timed-release aerosols) for consumer use** |
| **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 |

| |
|---|
| 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** |
| Body parts exposed : Assumes that potential dermal contact is limited to fingertips. |
| 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** |
|---|
| 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 | 0.00466 mg/L (EUSES v2.1) | 0.023 |
| Freshwater sediment | 0.025 mg/kg dry weight (EUSES v2.1) | 0.021 |
| Marine water | 0.000447 mg/L (EUSES v2.1) | 0.022 |
| Marine sediment | 0.00241 mg/kg dry weight (EUSES v2.1) | 0.02 |
| Sewage treatment plant | 0.041 mg/L (EUSES v2.1) | < 0.01 |
| Agricultural soil | 0.00728 mg/kg dry weight (EUSES v2.1) | < 0.01 |
| Man via environment - Inhalation | 0.0000775 mg/m³ (EUSES v2.1) | < 0.01 |
| Man via environment - Oral | 0.00064 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 | 0.093 |
| | | | web 1.1.0) | |
| dermal | systemic | long-term | 0.296 mg/kg bw/day (ConsExpo web 1.1.0) | 0.059 |
| 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 | Exposure level | RCR |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| | | **indicator** | | |
| 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: Formulation or re-packing, Industrial formulation of personal care products**

**8.1. 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,** |

| |
|---|
| PROC3,<br>**grease manufacture)** |
| **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, |

**8.2. Conditions of use affecting exposure**

**8.2.1. 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<br>: 0 kg<br>water |
| Maximum daily local emission to air : 5 t |
| **Conditions and measures related to sewage treatment plant** |

| |
|---|
| STP type : Biological Sewage Treatment Plant<br>STP sludge treatment : Sewage sludge may be recovered for agricultural or horticultural purposes<br>STP effluent : 2,000 m3/d |
| STP<br>Water - minimum efficiency of 87.36 % |

| |
|---|
| **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 |

**8.2.2. 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 |

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

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

| |
|---|
| 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.<br>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 |

**8.2.5. 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<br>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.<br>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 |

**8.2.6. 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<br>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 |

**8.2.7. 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. |

| |
|---|
| **Conditions and measures related to personal protection, hygiene and health evaluation** |
| General measures (eye irritants) |
| Wear suitable gloves tested to EN374.<br>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 |

**8.2.8. 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<br>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.<br>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 |

**8.2.9. 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 |

| 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<br>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.<br>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 |

**8.2.10. 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<br>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<br>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.<br>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 |

**8.2.11. 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<br>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.<br>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 |

**8.2.12. 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)** |

| |
|---|
| 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<br>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.<br>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 |

**8.2.13. 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<br>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.<br>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 |

**8.2.14. 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.<br>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 |

**8.2.15. 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. |

| |
|---|
| 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 |

**8.2.16. 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 |

**8.3. Exposure estimation and reference to its source**

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

| Compartment | Exposure level | RCR |
|---|---|---|
| Freshwater | 0.000539 mg/L (EUSES v2.1) | < 0.01 |
| Freshwater sediment | 0.0029 mg/kg dry weight (EUSES v2.1) | < 0.01 |
| Marine water | 0.0000351 mg/L (EUSES v2.1) | < 0.01 |
| Marine sediment | 0.000189 mg/kg dry weight (EUSES v2.1) | < 0.01 |
| Sewage treatment plant | 0 mg/L (EUSES v2.1) | < 0.01 |
| Agricultural soil | 0.07 mg/kg dry weight (EUSES v2.1) | 0.028 |
| Man via environment - Inhalation | 0.381 mg/m³ (EUSES v2.1) | 0.025 |
| Man via environment - Oral | 0.889 mg/kg bw/day (EUSES v2.1) | 0.178 |
| Man via environment - combined routes | | 0.203 |

**8.3.2. 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 |
| combined routes | systemic | long-term | | < 0.01 |

**8.3.3. 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 |
| combined routes | systemic | long-term | | 0.046 |

**8.3.4. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / 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 |
| dermal | systemic | long-term | 0.138 mg/kg bw/day (ECETOC TRA worker v3) | 0.014 |
| combined routes | systemic | long-term | | 0.069 |

**8.3.5. 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 |
| combined routes | systemic | long-term | | 0.146 |

**8.3.6. 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 |
| combined routes | systemic | long-term | | 0.075 |

**8.3.7. 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 |
| combined routes | systemic | long-term | | 0.041 |

**8.3.8. 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 |
| combined routes | systemic | long-term | | 0.016 |

**8.3.9. 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 | 0.274 |
| | | | (ECETOC TRA worker v3) | |
| combined routes | systemic | long-term | | 0.279 |

**8.3.10. 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 |
| combined routes | systemic | long-term | | 0.32 |

**8.3.11. 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 |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| 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 |
| combined routes | systemic | long-term | | 0.293 |

**8.3.12. 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 |
| combined routes | systemic | long-term | | 0.114 |

**8.3.13. 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 |
| combined routes | systemic | long-term | | 0.183 |

**8.3.14. 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 |
| combined routes | systemic | long-term | | 0.082 |

**8.3.15. 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 |
| combined routes | systemic | long-term | | < 0.01 |

**8.3.16. 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 |
| combined routes | systemic | long-term | | 0.143 |

**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.

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

### 1.1 Product identifier

- Trade name AUGEO
- 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.

## 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<br>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**

- Quickly move the person away from the contaminated area. Make the affected person rest.
- Obtain medical attention.

**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.

**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.
- Always obtain medical advice, even if there are no symptoms.

**In case of ingestion**

- Do NOT induce vomiting.
- Obtain medical attention.
- Do not give anything to drink.

### 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.

## 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.

- 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.
- 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.

**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

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**

- 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

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**

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

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

**Biodegradability**
No data available

**Physical- and photo-chemical elimination**

**Biodegradation**

2,2-dimethyl-1,3-dioxolan-4-ylmethanol Ready biodegradability study:
Method: OECD Test Guideline 301 F

86.2 % - 28 Days

The 10 day time window criterion is fulfilled.
The substance fulfills the criteria for ultimate aerobic biodegradability and ready biodegradability

Theoretical oxygen demand
Inoculum: activated sludge
Unpublished internal 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 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 accumulation in organisms is not expected.
Due to the distribution coefficient n-octanol/water,

**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

**assessment**
**Known distribution to environmental compartments** No data available
**12.5 Results of PBT and vPvB**

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 |
| 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
- 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

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 :**
211

**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 | 0.000747 mg/L (EUSES v2.1) | < 0.01 |
| Freshwater sediment | 0.00402 mg/kg dry weight (EUSES v2.1) | < 0.01 |
| Marine water | 0.000056 mg/L (EUSES v2.1) | < 0.01 |
| Marine sediment | 0.000301 mg/kg dry weight (EUSES v2.1) | < 0.01 |
| Sewage treatment plant | 0.00209 mg/L (EUSES v2.1) | < 0.01 |
| Agricultural soil | 0.00581 mg/kg dry weight (EUSES v2.1) | < 0.01 |
| Man via environment - Inhalation | 0.0000775 mg/m³ (EUSES v2.1) | < 0.01 |
| Man via environment - Oral | 0.0006 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 |
| 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 | 0.00109 mg/L (EUSES v2.1) | < 0.01 |
| Freshwater sediment | 0.00589 mg/kg dry weight (EUSES v2.1) | < 0.01 |
| Marine water | 0.0000907 mg/L (EUSES v2.1) | < 0.01 |
| Marine sediment | 0.000488 mg/kg dry weight (EUSES v2.1) | < 0.01 |
| Sewage treatment plant | 0.00556 mg/L (EUSES v2.1) | < 0.01 |
| Agricultural soil | 0.00594 mg/kg dry weight (EUSES v2.1) | < 0.01 |

| | | |
|---|---|---|
| Man via environment - Inhalation | 0.0000775 mg/m³ (EUSES v2.1) | < 0.01 |
| Man via environment - Oral | 0.000603 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 |
|---|---|---|---|---|
| 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,** PROC3, **grease manufacture)** |
| **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** |

| |
|---|
| STP type : Biological Sewage Treatment Plant<br>STP sludge treatment : Sewage sludge may be recovered for agricultural or horticultural purposes<br>STP effluent : 2,000 m3/d |
| STP<br>Water - minimum efficiency of 87.36 % |
| **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)**

| 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.<br>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 |

| |
|---|
| 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.<br>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<br>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.<br>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<br>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. |

| |
|---|
| **Conditions and measures related to personal protection, hygiene and health evaluation** |
| General measures (eye irritants) |
| Wear suitable gloves tested to EN374.<br>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<br>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.<br>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 |

| |
|---|
| **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.<br>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<br>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<br>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.<br>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<br>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.<br>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)** |

| |
|---|
| 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<br>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.<br>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<br>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.<br>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 |

**3.2.14. 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.<br>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. |

| |
|---|
| 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 | 0.00856 mg/L (EUSES v2.1) | 0.043 |
| Freshwater sediment | 0.046 mg/kg dry weight (EUSES v2.1) | 0.039 |
| Marine water | 0.000837 mg/L (EUSES v2.1) | 0.042 |
| Marine sediment | 0.0045 mg/kg dry weight (EUSES v2.1) | 0.038 |
| Sewage treatment plant | 0.08 mg/L (EUSES v2.1) | < 0.01 |
| Agricultural soil | 0.013 mg/kg dry weight (EUSES v2.1) | < 0.01 |
| Man via environment - Inhalation | 0.024 mg/m³ (EUSES v2.1) | < 0.01 |
| Man via environment - Oral | 0.057 mg/kg bw/day (EUSES v2.1) | 0.011 |
| 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 |
| 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 |
| 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 |
| dermal | systemic | long-term | 0.138 mg/kg bw/day (ECETOC TRA worker v3) | 0.014 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 | 0.274 |
| | | | (ECETOC TRA worker v3) | |
| 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 |
| 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 |
|---|---|---|---|---|
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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.

**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<br>Water - minimum efficiency of 87.36 % |
| **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 ()**

| |
|---|
| **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.

| 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** |

| |
|---|
| 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 ()**

| |
|---|
| **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** |

| |
|---|
| General measures (eye irritants) |
| Use suitable eye protection. |
| Wear suitable gloves tested to EN374.<br>Dermal - minimum efficiency of >= 80 % |
| Wear suitable respiratory protection.<br>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 | 0.00148 mg/L (EUSES v2.1) | < 0.01 |
| Freshwater sediment | 0.00798 mg/kg dry weight (EUSES v2.1) | < 0.01 |
| Marine water | 0.00013 mg/L (EUSES v2.1) | < 0.01 |
| Marine sediment | 0.000697 mg/kg dry weight (EUSES v2.1) | < 0.01 |
| Sewage treatment plant | 0.00945 mg/L (EUSES v2.1) | < 0.01 |
| Agricultural soil | 0.00609 mg/kg dry weight (EUSES v2.1) | < 0.01 |
| Man via environment - Inhalation | 0.0000775 mg/m³ (EUSES v2.1) | < 0.01 |
| Man via environment - Oral | 0.000607 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 |
| dermal | systemic | long-term | 2.743 mg/kg bw/day (ECETOC TRA worker v3) | 0.274 |
| 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 | Exposure level | RCR |
|---|---|---|---|---|

| | | indicator | | |
|---|---|---|---|---|
| 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 |
| 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 |
| 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 |
| combined routes | systemic | long-term | | 0.247 |

**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 |
| 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 |
| 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 |
| 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 |
| dermal | systemic | long-term | 2.743 mg/kg bw/day (ECETOC TRA worker v3) | 0.274 |
| 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 |
| 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<br>Water - minimum efficiency of 87.36 % |
| **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 |

| **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.<br>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 | 0.00179 mg/L (EUSES v2.1) | < 0.01 |
| Freshwater sediment | 0.00962 mg/kg dry weight (EUSES v2.1) | < 0.01 |
| Marine water | 0.00016 mg/L (EUSES v2.1) | < 0.01 |
| Marine sediment | 0.000862 mg/kg dry weight (EUSES v2.1) | < 0.01 |
| Sewage treatment plant | 0.013 mg/L (EUSES v2.1) | < 0.01 |

| | | |
|---|---|---|
| Agricultural soil | 0.0062 mg/kg dry weight (EUSES v2.1) | < 0.01 |
| Man via environment - Inhalation | 0.0000775 mg/m³ (EUSES v2.1) | < 0.01 |
| Man via environment - Oral | 0.00061 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 |
| dermal | systemic | long-term | 1.097 mg/kg bw/day | 0.11 |
| | | | (ECETOC TRA worker v3) | |
| 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.

**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 |

| |
|---|
| 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<br>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 <= 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 ()**

| |
|---|
| **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** |

| |
|---|
| 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 | 0.00129 mg/L (EUSES v2.1) | < 0.01 |
| Freshwater sediment | 0.00691 mg/kg dry weight (EUSES v2.1) | < 0.01 |
| Marine water | 0.00011 mg/L (EUSES v2.1) | < 0.01 |
| Marine sediment | 0.000591 mg/kg dry weight (EUSES v2.1) | < 0.01 |
| Sewage treatment plant | 0.00747 mg/L (EUSES v2.1) | < 0.01 |
| Agricultural soil | 0.00601 mg/kg dry weight (EUSES v2.1) | < 0.01 |
| Man via environment - Inhalation | 0.0000775 mg/m³ (EUSES v2.1) | < 0.01 |
| Man via environment - Oral | 0.000605 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 1.1.0) | < 0.01 |
| 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 | 0.343 |

| | | | | |
|---|---|---|---|---|
| | | | consumer v3) | |
| dermal | systemic | long-term | 1.429 mg/kg bw/day (ECETOC TRA consumer v3) | 0.286 |
| 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.

**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)** PC3_1, **Timed-release aerosols) for consumer use** |
| **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 |

| |
|---|
| 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** |
| Body parts exposed : Assumes that potential dermal contact is limited to fingertips. |
| 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 |
|---|
| 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 | 0.00466 mg/L (EUSES v2.1) | 0.023 |
| Freshwater sediment | 0.025 mg/kg dry weight (EUSES v2.1) | 0.021 |
| Marine water | 0.000447 mg/L (EUSES v2.1) | 0.022 |
| Marine sediment | 0.00241 mg/kg dry weight (EUSES v2.1) | 0.02 |
| Sewage treatment plant | 0.041 mg/L (EUSES v2.1) | < 0.01 |
| Agricultural soil | 0.00728 mg/kg dry weight (EUSES v2.1) | < 0.01 |
| Man via environment - Inhalation | 0.0000775 mg/m³ (EUSES v2.1) | < 0.01 |
| Man via environment - Oral | 0.00064 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 0.093 | |
| | | | web 1.1.0) | |
| dermal | systemic | long-term | 0.296 mg/kg bw/day (ConsExpo web 1.1.0) | 0.059 |
| 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: Formulation or re-packing, Industrial formulation of personal care products**

**8.1. 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,** PROC3, **grease manufacture)** |

| |
|---|
| **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, |

**8.2. Conditions of use affecting exposure**

**8.2.1. 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** |

| |
|---|
| STP type : Biological Sewage Treatment Plant<br>STP sludge treatment : Sewage sludge may be recovered for agricultural or horticultural purposes<br>STP effluent : 2,000 m3/d |
| STP<br>Water - minimum efficiency of 87.36 % |
| **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 |

**8.2.2. 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 |

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

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

| |
|---|
| 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.<br>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 |

**8.2.5. 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<br>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.<br>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 |

**8.2.6. 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<br>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 |

**8.2.7. 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. |

| Conditions and measures related to personal protection, hygiene and health evaluation |
|---|
| General measures (eye irritants) |
| Wear suitable gloves tested to EN374.<br>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 |

**8.2.8. 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<br>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.<br>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 |

**8.2.9. 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 |

| |
|---|
| **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<br>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.<br>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 |

**8.2.10. 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<br>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<br>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.<br>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 |

**8.2.11. 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<br>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.<br>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 |

**8.2.12. 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)** |

| |
|---|
| 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<br>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.<br>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 |

**8.2.13. 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<br>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.<br>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 |

**8.2.14. 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.<br>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 |

**8.2.15. 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. |

| |
|---|
| 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 |

**8.2.16. 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 |

**8.3. Exposure estimation and reference to its source**

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

| Compartment | Exposure level | RCR |
|---|---|---|
| Freshwater | 0.000539 mg/L (EUSES v2.1) | < 0.01 |
| Freshwater sediment | 0.0029 mg/kg dry weight (EUSES v2.1) | < 0.01 |
| Marine water | 0.0000351 mg/L (EUSES v2.1) | < 0.01 |
| Marine sediment | 0.000189 mg/kg dry weight (EUSES v2.1) | < 0.01 |
| Sewage treatment plant | 0 mg/L (EUSES v2.1) | < 0.01 |
| Agricultural soil | 0.07 mg/kg dry weight (EUSES v2.1) | 0.028 |
| Man via environment - Inhalation | 0.381 mg/m³ (EUSES v2.1) | 0.025 |
| Man via environment - Oral | 0.889 mg/kg bw/day (EUSES v2.1) | 0.178 |
| Man via environment - combined routes | | 0.203 |

**8.3.2. 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 | < 0.01 |

| | | | | |
|---|---|---|---|---|
| | | | worker v3) | |
| dermal | systemic | long-term | 0.034 mg/kg bw/day (ECETOC TRA worker v3) | < 0.01 |
| combined routes | systemic | long-term | | < 0.01 |

**8.3.3. 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 |
| combined routes | systemic | long-term | | 0.046 |

**8.3.4. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / 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 |
| dermal | systemic | long-term | 0.138 mg/kg bw/day (ECETOC TRA worker v3) | 0.014 |
| combined routes | systemic | long-term | | 0.069 |

**8.3.5. 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 |
| combined routes | systemic | long-term | | 0.146 |

**8.3.6. 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 |
| combined routes | systemic | long-term | | 0.075 |

**8.3.7. 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 |
| combined routes | systemic | long-term | | 0.041 |

**8.3.8. 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 |
| combined routes | systemic | long-term | | 0.016 |

**8.3.9. 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 | 0.274 |
| | | | (ECETOC TRA worker v3) | |
| combined routes | systemic | long-term | | 0.279 |

**8.3.10. 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 |
| combined routes | systemic | long-term | | 0.32 |

**8.3.11. 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 |
|---|---|---|---|---|
| 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 |
| combined routes | systemic | long-term | | 0.293 |

**8.3.12. 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 |
| combined routes | systemic | long-term | | 0.114 |

**8.3.13. 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 |
| combined routes | systemic | long-term | | 0.183 |

**8.3.14. 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 |
| combined routes | systemic | long-term | | 0.082 |

**8.3.15. 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 |
| combined routes | systemic | long-term | | < 0.01 |

**8.3.16. 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 |
| combined routes | systemic | long-term | | 0.143 |

**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.