

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Givaudan

GLYCOLIERRAL

Version 23.0

Revision Date 11 JUL 2024

Print Date 09 SEP 2024

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

1.1 Product identifier

Sales No. : 5631203
GLYCOLIERRAL

Substance name : 2-[7(8)-ISOPROPYL-5(6)-METHYLBICYCLO[2.2.2]OCT-5-EN-2-YL]-1,3-DIOXOLANE

Identifier

CAS-No. : 68901-32-6
94087-23-7

EC-No. : 916-737-4

REACH Registration Number : 01-2120118326-63

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

Intended Use Fragrances : Perfumery ingredient

1.3 Details of the supplier of the safety data sheet

Company :

Givaudan Suisse SA
Chemin de la Parfumerie 5
CH-1214 VERNIER

Telephone : +41227809111

Telefax : +41227809150

E-mail address : global.sds_info@givaudan.com

Responsible/issuing person

Legal Entity : Givaudan France SAS
55 Voie des Bans
F-95102 ARGENTEUIL

1.4 Emergency telephone number

Givaudan 24/7 call : +33172110003

Please refer to section 16 for a full list of emergency phone numbers, from Givaudan's 24/7 provider.

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Administrative information:

Report Information: SDS_EU/EN/GHS_SDS_EU_REGION/41

Sales & Distribution Information: VE01/FR/CH11/01

Shipping Order Information: 31 593 478/27 154 158

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Skin irritation, Category 2
Long-term (chronic) aquatic hazard, Category 2

H315: Causes skin irritation.
H411: Toxic to aquatic life with long lasting effects.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms :



Signal word : **Warning**

Hazard statements : **H315** Causes skin irritation.
H411 Toxic to aquatic life with long lasting effects.

Precautionary statements : **Prevention:**
P264 Wash skin thoroughly after handling.
P273 Avoid release to the environment.
P280 Wear protective gloves.
Response:
P332 + P313 If skin irritation occurs: Get medical advice/attention.
P391 Collect spillage.
Disposal:
P501 Dispose of contents/ container to an approved waste disposal plant.

2.3 Other hazards

Hazards not Otherwise Classified. : None

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

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

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

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SECTION 3: Composition/information on ingredients**3.1 Substances**

| Chemical name | CAS-No. EC-No. REACH Registration Number | Concentration [Percent by weight] | M-Factor, SCL, ATE |
|---|---|--------------------------------------|---|
| 2-[7(8)-isopropyl-5(6)-methylbicyclo[2.2.2]oct-5-en-2-yl]-1,3-dioxolane | 68901-32-6 94087-23-7 916-737-4 01-2120118326-63 | >= 90 - <= 100 | Acute toxicity estimate Acute oral toxicity:> 8 000,00 mg/kg |

SECTION 4: First aid measures**4.1 Description of first aid measures**

| | |
|-------------------------|---|
| General advice | : Do not leave the victim unattended. Move out of dangerous area. Show this safety data sheet to the doctor in attendance. |
| If inhaled | : If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician. |
| In case of skin contact | : If on skin, rinse well with water. If on clothes, remove clothes. Immediately seek medical attention if chemical entered ear canal. If skin irritation persists, call a physician. |
| In case of eye contact | : Protect unharmed eye. Remove contact lenses. Flush eyes with water as a precaution. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist. |
| If swallowed | : Immediately consult Poison Control Center or physician. Keep respiratory tract clear. Do NOT induce vomiting. Do not give milk or alcoholic beverages. Never give anything by mouth to an unconscious person. |

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If symptoms persist, call a physician.

4.2 Most important symptoms and effects, both acute and delayed

| | |
|----------|---------------------------|
| Symptoms | : no data available |
| Risks | : Causes skin irritation. |

4.3 Indication of any immediate medical attention and special treatment needed

| | |
|-----------|--------------------------|
| Treatment | : Treat symptomatically. |
|-----------|--------------------------|

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Unsuitable extinguishing media : High volume water jet

5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting : Do not allow run-off from fire fighting to enter drains or water courses.

5.3 Advice for firefighters

Special protective equipment for firefighters : Wear self-contained breathing apparatus for firefighting if necessary.

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

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Keep people away from and upwind of spill/leak.
For emergency conditions, use an approved positive-pressure self-contained breathing apparatus.
Material can create slippery conditions.
Use personal protective equipment.

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6.2 Environmental precautions

Environmental precautions : Prevent product from entering drains.
If the product contaminates rivers and lakes or drains inform respective authorities.

6.3 Methods and materials for containment and cleaning up

Methods for cleaning up : Clean contaminated floors and objects thoroughly while observing environmental regulations.
Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).
Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

Not applicable

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling : Do not breathe vapours/dust.
Avoid contact with skin and eyes.
For personal protection see section 8.
Smoking, eating and drinking should be prohibited in the application area.
Dispose of rinse water in accordance with local and national regulations.

Advice on protection against fire and explosion : Normal measures for preventive fire protection.

Temperature class : no data available

Fire-fighting class : no data available

Dust explosion class : no data available

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : Keep container tightly closed in a dry and well-ventilated place.
Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Electrical installations / working materials must comply with the technological safety standards.

Further information on storage conditions : Store Ambient 10-30°C (50-85°F)
Dry, well ventilated, preferably full, hermetically sealed

Advice on common storage : Protect against light.

Storage class (TRGS 510) : 10 Combustible liquids

Other data : No decomposition if stored and applied as directed.

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7.3 Specific end use(s)

Please refer to attached exposure scenarios.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Contains no substances with occupational exposure limit values.

| | | |
|------|---|---|
| DNEL | : | End Use: Consumer use Exposure routes: Dermal Potential health effects: Acute local effects not required |
| DNEL | : | End Use: Consumer use Exposure routes: Dermal Potential health effects: Acute systemic effects No hazard identified |
| DNEL | : | End Use: Consumer use Exposure routes: Dermal Potential health effects: Long-term local effects No hazard identified |
| DNEL | : | End Use: Consumer use Exposure routes: Dermal Potential health effects: Long-term systemic effects Value: 1,5 mg/kg bw/day |
| DNEL | : | End Use: Consumer use Exposure routes: Inhalation Potential health effects: Acute local effects No hazard identified |
| DNEL | : | End Use: Consumer use Exposure routes: Inhalation Potential health effects: Acute systemic effects No hazard identified |
| DNEL | : | End Use: Consumer use Exposure routes: Inhalation Potential health effects: Long-term local effects Value: 6,52 mg/m3 |
| DNEL | : | End Use: Consumer use Exposure routes: Inhalation Potential health effects: Long-term systemic effects Value: 2,61 mg/m3 |
| DNEL | : | End Use: Consumer use Exposure routes: Oral Potential health effects: Long-term systemic effects |

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Value: 1,5 mg/kg bw/day

| | |
|------|--|
| DNEL | : End Use: Workers Exposure routes: Dermal Potential health effects: Acute local effects not required |
| DNEL | : End Use: Workers Exposure routes: Dermal Potential health effects: Acute systemic effects No hazard identified |
| DNEL | : End Use: Workers Exposure routes: Dermal Potential health effects: Long-term local effects No hazard identified |
| DNEL | : End Use: Workers Exposure routes: Dermal Potential health effects: Long-term systemic effects Value: 4,2 mg/kg bw/day |
| DNEL | : End Use: Workers Exposure routes: Inhalation Potential health effects: Acute local effects No hazard identified |
| DNEL | : End Use: Workers Exposure routes: Inhalation Potential health effects: Acute systemic effects No hazard identified |
| DNEL | : End Use: Workers Exposure routes: Inhalation Potential health effects: Long-term local effects Value: 26,45 mg/m3 |
| DNEL | : End Use: Workers Exposure routes: Inhalation Potential health effects: Long-term systemic effects Value: 14,8 mg/m3 |
| PNEC | : Fresh water Value: 0,00279 mg/l |
| PNEC | : Marine water Value: 0,000279 mg/l |
| PNEC | : Fresh water sediment Value: 3,23 mg/kg dry weight (d.w.) |
| PNEC | : Marine sediment Value: 0,322 mg/kg dry weight (d.w.) |

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PNEC : Soil
Value: 0,64 mg/kg dry weight (d.w.)

PNEC : Sewage treatment plant
Value: 10,0 mg/l

8.2 Exposure controls

Exposure assessment: Exposures are dependent on the product being handled, the potential for chemical release, and any resulting airborne concentrations or dermal contact. Since product handling and release scenarios vary, and no two workplaces are exactly alike, it is recommended that the potential for exposure be assessed prior to the product's use or introduction. Exposure assessments should be performed by an occupational hygienist, industrial hygienist, or other qualified occupational or environmental health professional. An exposure assessment should be conducted to determine the efficacy of any ventilation and the need for additional PPE. The PPE indicated below are recommendations for worst-case scenario exposures. An exposure assessment will identify more applicable measures to be implemented. EN and ANSI standards are mentioned in the following recommendations, consult equivalent local standards when required.

PPE is always the last resort to avoid exposure. In any case technical and organisational measures have to be explored and used prior to the selection of PPE. The PPE selection is for operators trained to work with chemicals according to good industrial hygiene and safety practice. Operators have to be trained on the use of PPE.

8.2.1 Engineering measures

Use engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use the product only with adequate ventilation.

8.2.2 Personal protective equipment

Eye/face protection : Use safety goggles tested according to EN 166/ ANSI Z87.1 or equivalent local standard.

Hand protection : Use gloves when handling substance in open systems. Inspect gloves prior to use. Train operators for proper use. If only incidental exposure is expected: (work without direct contact to substance) use gloves tested according EN 16523-1/ASTM F739 or equivalent local standard breakthrough times at least 10 minutes, tested for chemicals indicated in chapter 3 of this SDS. Change gloves frequently.
If direct skin contact is expected: use gloves tested according to EN 16523-1/ASTM F739 or equivalent local standard, tested for chemicals indicated in chapter 3 of this SDS.

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Permeation time must exceed contact time.

Other skin protection : Wear working clothes covering arms and legs.

Respiratory protection : Respiratory protection should be worn when workplace exposures exceed exposure limit requirements or guidelines. If there are no applicable exposure limits or guidelines, use an approved respirator where there is a potential for adverse effects, including but not limited to respiratory irritation or odor, or where indicated by the exposure assessment. Selection of air-purifying or positive-pressure supplied-air will depend on the results of the exposure assessment which includes an evaluation of the specific operations and the potential airborne concentrations. For emergency conditions, use an approved positive-pressure self-contained breathing apparatus.

In case a risk analysis proved the cartridge respirator as acceptable, use type:
ABEK-P3 (EN 14387) OR Combination Multi-gas/P100 (42CFR84.193; ANSI Z88.7 or equivalent local standard) as a backup to engineering controls.

In absence of engineering controls, use self-contained breathing apparatus or full face supplied air respirators. Use respirators and components tested and approved under appropriate government standards such as CEN (EU) or NIOSH 42 CFR 84(US).

Thermal hazards : Wear appropriate thermal protective clothing, when necessary.

Hygiene measures : Remove contaminated clothing and protective equipment before entering eating areas.
Do not eat, drink or smoke during work.
Wash hands any time after handling the product.

8.2.3 Environmental exposure controls

General advice : Prevent product from entering drains.
If the product contaminates rivers and lakes or drains inform respective authorities.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state : liquid
Form : liquid
Colour : colorless to Pale yellow

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| | |
|--|--|
| Taste | : not determined |
| Odour | : Floral, fruity, Green, mild |
| Odour Threshold | : 38,9 ng/l |
| Flash point | : 118 °C Method: Pensky-Martens closed cup Regulation (EC) No. 440/2008, Annex, A.9 |
| Lower explosion limit | : not determined |
| Upper explosion limit | : not determined |
| Flammability | : no data available |
| Particle size | : no data available |
| Oxidizing properties | : The substance or mixture is not classified as oxidizing. |
| Auto-ignition temperature | : 240 °C Method: DIN 51794 |
| Decomposition temperature | : no data available |
| Molecular weight | : 236,00 g/mol |
| pH | : no data available |
| Melting point | : -59 °C Method: OECD Test Guideline 102 |
| Boiling point | : 288 °C at 1 013 hPa Method: OECD Test Guideline 103 |
| Vapour pressure | : 0,0039 hPa at 25 °C Method: OECD Test Guideline 104 0,0021 hPa at 20 °C Method: OECD Test Guideline 104 |
| Density | : 1 009,96 kg/m3 at 20 °C Method: OECD Test Guideline 109 |
| Bulk density | : Not applicable |
| Water solubility | : 8,39 mg/l at 25 °C Method: OECD Test Guideline 105 |
| Solubility/qualitative | : practically insoluble |
| Partition coefficient: n-octanol/water | : log Pow: 5,3 Method: OECD Test Guideline 117 |
| Viscosity, kinematic | : no data available |
| Relative vapour density | : no data available |
| Surface tension | : 65,8 mN/m at 20 °C Method: OECD Test Guideline 115 |
| Evaporation rate | : no data available |
| Explosive properties | : Not explosive |

9.2 Other information

Not applicable

SECTION 10: Stability and reactivity

10.1 Reactivity

No decomposition if stored and applied as directed.

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10.2 Chemical stability

No decomposition if stored and applied as directed.

10.3 Possibility of hazardous reactions

Hazardous reactions : No decomposition if stored and applied as directed. Essentially not reactive with water.

10.4 Conditions to avoid

Conditions to avoid : no data available

10.5 Incompatible materials

Materials to avoid : Not applicable

10.6 Hazardous decomposition products

Hazardous decomposition products : no data available

Thermal decomposition : no data available

SECTION 11: Toxicological information

Acute toxicity

Acute oral toxicity : LD50 Rat
Dose: > 8 000 mg/kg

Acute inhalation toxicity : This information is not available.

Acute dermal toxicity : This information is not available.

Acute toxicity (other routes of administration) : No data is available on the product itself.

Skin corrosion/irritation

Skin irritation : Species: In vitro
Skin irritation
Method: OECD Test Guideline 439
May cause skin irritation in susceptible persons.

Serious eye damage/eye irritation

Eye irritation : Species: In vitro
No eye irritation
Method: OECD Test Guideline 437

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Vapours may cause irritation to the eyes, respiratory system and the skin.

Respiratory or skin sensitisation

Sensitisation : HRIPT Human
Result: Not sensitizing
at 5 % in Dimethyl phthalate

Open epicutaneous test Guinea pig
Result: Not sensitizing

KeratinoSens assay
Result: Not sensitizing
Method: OECD Test Guideline 442D

Direct Peptide Reactivity Assay (DPRA)
Result: Not sensitizing
Method: OECD Test Guideline 442C

Germ cell mutagenicity

Genotoxicity in vitro : Ames test
negative
Method: OECD Test Guideline 471

negative
Method: OECD Test Guideline 476

negative
Method: OECD Test Guideline 487

Carcinogenicity

Carcinogenicity : No data is available on the product itself.

Reproductive toxicity

Not classified due to lack of data.

Effects on foetal development : Species: Rat, male and female
Application Route: Oral
General Toxicity Maternal: NOAEL: 600 mg/kg body weight
Method: OECD Test Guideline 422
GLP: yes

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Target Organ Systemic Toxicant - Single exposure

Target Organ Systemic Toxicant - Single exposure : No data is available on the product itself.

Target Organ Systemic Toxicant - Repeated exposure

Target Organ Systemic Toxicant - Repeated exposure : Species: Rat, male and female
Application Route: Oral
NOAEL: 600 mg/kg
Method: OECD Test Guideline 422

Aspiration hazard

Aspiration toxicity : No data is available on the product itself.

Phototoxicity

Phototoxicity : Phototoxicity Guinea pig
Result:negative

Further information : no data available

11.2 Information on other hazards

Endocrine disrupting properties

Product:

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

Further information

Product:

Remarks : no data available

SECTION 12: Ecological information

12.1 Toxicity

Product:

Toxicity to fish : LC50 (Gobiocypris rarus (rare gudgeon)): 2,79 mg/l

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| | |
|---|--|
| | Exposure time: 96 h Test Type: semi-static test Method: OECD Test Guideline 203 GLP: yes |
| Toxicity to daphnia and other aquatic invertebrates | : (Daphnia magna (Water flea)): 2,8 mg/l Exposure time: 48 h Test Type: static test Method: OECD Test Guideline 202 GLP: yes |
| Toxicity to algae/aquatic plants | : EC50 (Pseudokirchneriella subcapitata (algae)): > 7,5 mg/l Exposure time: 72 h Test Type: static test Method: OECD Test Guideline 201 GLP: yes |
| | EC10 (Pseudokirchneriella subcapitata (algae)): 3,4 mg/l Exposure time: 72 h Test Type: static test Method: OECD Test Guideline 201 GLP: yes |
| | NOEC (Pseudokirchneriella subcapitata (algae)): 2,5 mg/l Exposure time: 72 h Test Type: static test Method: OECD Test Guideline 201 GLP: yes |
| Toxicity to microorganisms | : EC50 (activated sludge): > 100 mg/l Method: OECD Test Guideline 209 GLP: yes |
| | : EC10 (activated sludge): 100 mg/l Method: OECD Test Guideline 209 GLP: yes |
| | : NOEC (Soil): >= 1 000 mg/l Exposure time: 28 d Method: OECD Test Guideline 216 GLP: yes |
| Toxicity to soil dwelling organisms | : EC10: 25,1 mg/kg Exposure time: 56 d Species: Eisenia fetida (earthworms) Method: OECD Test Guideline 222 GLP:yes |
| Plant toxicity | : MATC: 6,4 mg/kg |

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Test period: 14 d
Species: Pea (*Pisum sativum* L.)
Method: OECD Test Guideline 208
GLP: yes

Ecotoxicology Assessment

Chronic aquatic toxicity : Toxic to aquatic life with long lasting effects.

12.2 Persistence and degradability

Product:

Biodegradability : Result: Not inherently biodegradable.
Biodegradation: 0 %
Exposure time: 42 d
Method: OECD Test Guideline 302 C
GLP: yes

Result: Not readily biodegradable.
Biodegradation: 0 %
Exposure time: 28 d
Method: OECD Test Guideline 301 F
GLP: yes

12.3 Bioaccumulative potential

Product:

Bioaccumulation : Species: *Oncorhynchus mykiss* (rainbow trout)
Exposure time: 60 min
Temperature: 11 °C
Bioconcentration factor (BCF): 877
Method: see user defined free text

12.4 Mobility in soil

Product:

Distribution among environmental compartments : log K_{oc}: 3,5
Method: OECD Test Guideline 121

12.5 Results of PBT and vPvB assessment

Product:

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

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12.6 Endocrine disrupting properties

Product:

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

12.7 Other adverse effects

Product:

Additional ecological information : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Toxic to aquatic life with long lasting effects.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product : Send to a licensed waste management company.
Dispose of in accordance with local, state and federal regulations.
The product should not be allowed to enter drains, water courses or the soil.
Do not contaminate ponds, waterways or ditches with chemical or used container.

Contaminated packaging : Do not expose containers to high temperatures such as in hot work processes.
Empty remaining contents.
Dispose of as unused product.
Do not re-use empty containers.

Dispose of in accordance with local regulations.

SECTION 14: Transport information

14.1 UN number

ADR : UN 3082
RID : UN 3082
IMDG : UN 3082

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IATA : UN 3082

14.2 UN proper shipping name

ADR : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
(7(8)-isopropyl-5(6)-methylbicyclo[2.2.2]oct-5-en-2-yl)-1,3-dioxolane)

RID : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
(7(8)-isopropyl-5(6)-methylbicyclo[2.2.2]oct-5-en-2-yl)-1,3-dioxolane)

IMDG : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
(7(8)-isopropyl-5(6)-methylbicyclo[2.2.2]oct-5-en-2-yl)-1,3-dioxolane)

IATA : Environmentally hazardous substance, liquid, n.o.s.
(7(8)-isopropyl-5(6)-methylbicyclo[2.2.2]oct-5-en-2-yl)-1,3-dioxolane)

14.3 Transport hazard class(es)

ADR : 9

RID : 9

IMDG : 9

IATA : 9

14.4 Packing group

ADR : III

RID : III

IMDG : III

IATA : III

14.5 Environmental hazards

ADR
Environmentally hazardous : yes

RID
Environmentally hazardous : yes

IMDG
Marine pollutant : yes

IATA (Passenger)
Environmentally hazardous : yes

IATA (Cargo)

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Environmentally hazardous : yes

14.6 Special precautions for user

ADR

Tunnel restriction code : (-)

IMDG

IMDG Code Segregation : None
Group

14.7 Maritime transport in bulk according to IMO instruments

Not applicable for product as supplied.

SECTION 15: Regulatory information

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

REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59) : Neither banned nor restricted

Major Accident Hazard Legislation : ENVIRONMENTAL HAZARDS
E2
Quantity 1: 200 t
Quantity 2: 500 t

Water hazard class (Germany) : WGK 2 obviously hazardous to water
Code Number: 5 808
Remarks: German legislation on water endangering substances VwVwS

15.2 Chemical safety assessment

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

SECTION 16: Other information

Full list of Emergency response numbers worldwide.

| | Country | Phone nr | | Country | Phone nr |
|--------|------------|-------------------|------|--------------------------|---------------|
| Europe | All Europe | +44 1235 239670 | APAC | All East/South East Asia | +65 3158 1074 |
| | France | +33 1 72 11 00 03 | | Sri Lanka | +65 3158 1195 |

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| | | | | | |
|--------------------|-------------------------|----------------------------------|-------|-------------|-----------------------------------|
| | Germany | +49 89 220 61012 | | Taiwan | +886 2 8793 3212 |
| | Spain | +34 91 114 2520 | | Japan | 0120 015 230 |
| | Italy | 800 699 792 | | Indonesia | 007 803 011 0293 |
| | Netherlands | +31 10 713 8195 | | Malaysia | +60 3 6207 4347 |
| | Turkey | 0800 621 2139 +44 1235 239670 | | Thailand | 001 800 120 666 751 |
| | Norway | +47 2103 4452 | | India | +65 3158 1198 000 800 100 7479 |
| | Greece | +30 21 1198 3182 | | Pakistan | +65 3158 1329 |
| | Portugal | +351 30880 4750 | | Bangladesh | +65 3158 1200 |
| | Denmark | +45 8988 2286 | | Philippines | +63 2 8231 2149 |
| | Sweden | +46 8 566 42573 | | Vietnam | +84 28 4458 2388 |
| | Poland | +48 22 307 3690 | | Korea | +65 3158 1285 |
| | Czech republic | +420 228 882 830 | | South Korea | +82 2 3479 8401 |
| | Finland | +358 9 7479 0199 | | Australia | +61 2 8014 4558 |
| | | | | New Zealand | +64 9 929 1483 |
| Middle East/Africa | All Middle East/Africa | +44 1235 239671 | LATAM | China | +86 532 8388 9090 |
| | Bahrain and Middle East | +44 1235 239671 | | Mexico | +52 55 5004 8763 |
| | Africa/South Africa | +27 21 300 2732 | | Brazil | +55 11 3197 5891 |
| NOAM | USA and Canada | +1 866 928 0789 | | Chile | +56 2 2582 9336 |
| | USA and Canada | +1 215 207 0061 | | Colombia | +57 1 508 7337 |
| | USA and Canada | +1 202 464 2554 | | Argentina | +54 11 5984 3690 |
| Global | Global | +44 1865 407333 | | | |

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

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

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

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Information displayed in section 3 (Composition/information on ingredients) is additional information to understand the hazards of the product and ensure safe handling, storage and transportation. This information, including CAS numbers, is not meant to be used for registration, notification or any other purposes. Any additional information and documentation needed may be provided by Givaudan.

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Annex

Exposure Scenario

| Number | Title |
|--------|---|
| ES1 | Formulation of fragrance compounds (mixing of fragrance substances into fragrance compounds) |
| ES2 | Formulation of fragranced end-products (mixing of fragrance compounds into fragranced end-products) |
| ES3 | Professional end-use of washing, cleaning and disinfecting products (including use at industrial sites) |
| ES4 | Professional end-use of polishes and wax blends |
| ES5 | Consumer end-use of washing and cleaning products |
| ES6 | Consumer end-use of air care products |
| ES7 | Consumer end-use of biocides |
| ES8 | Consumer end-use of polishes and wax blends |
| ES9 | Consumer (and Professional) end-use of cosmetics |

1. ES 1: Formulation or re-packing

1.1. Title section

ES name: GES 1; Formulation of fragrance compounds (mixing of fragrance substances into fragrance compounds)

| | |
|--|---------|
| Environment | |
| 1: GES 1; Formulation of fragrance compounds (mixing of fragrance substances into fragrance compounds); large/medium sites | ERC 2 |
| 2: GES 1; Formulation of fragrance compounds (mixing of fragrance substances into fragrance compounds); small sites | ERC 2 |
| Worker | |
| 3: Transfer of substance or mixture (charging/discharging) at dedicated facilities | PROC 8b |
| 4: Storage | PROC 1 |
| 5: Mixing or blending in batch processes; Closed systems; Filling of articles/equipment; With sample collection | PROC 3 |
| 6: Mixing or blending in batch processes; Open systems; Filling of articles/equipment; With sample collection | PROC 5 |
| 7: Use as laboratory reagent | PROC 15 |
| 8: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) | PROC 9 |
| 9: Equipment cleaning and maintenance | PROC 8a |

1.2. Conditions of use affecting exposure

1.2.1. Control of environmental exposure: GES 1; Formulation of fragrance compounds (mixing of fragrance substances into fragrance compounds); large/medium sites (ERC 2)

| |
|---|
| Amount used, frequency and duration of use (or from service life) |
| Annual amount per site <= 2.5 tonnes/year |
| Daily amount per site <= 0.01 tonnes/day |

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Conditions and measures related to biological sewage treatment plant

Municipal sewage treatment plant is assumed.

Yes; application of the STP sludge on agricultural soil

Assumed domestic sewage treatment plant flow $\geq 2E3$ m³/day

Other conditions affecting environmental exposure

Receiving surface water flow $\geq 1.8E4$ m³/day

1.2.2. Control of environmental exposure: GES 1; Formulation of fragrance compounds (mixing of fragrance substances into fragrance compounds); small sites (ERC 2)

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

Annual amount per site ≤ 0.2 tonnes/year

Daily amount per site $\leq 8E-4$ tonnes/day

Conditions and measures related to biological sewage treatment plant

Municipal sewage treatment plant is assumed.

Yes; application of the STP sludge on agricultural soil

Assumed domestic sewage treatment plant flow $\geq 2E3$ m³/day

Other conditions affecting environmental exposure

Receiving surface water flow $\geq 1.8E4$ m³/day

1.2.3. Control of worker exposure

Conditions of use applicable to all contributing scenarios

Product (article) characteristics

Liquid

Amount used (or contained in articles), frequency and duration of use/exposure

Covers use up to 4 h/day

Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.; Ensure regular inspection, cleaning and maintenance of equipment and machines.; Clear spills immediately.; Ensure daily cleaning of the equipment.

Room ventilation; Basic; Up to 3 air change per hour

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.; For further specification, refer to section 8 of the SDS.

Respiratory protection; No.

Use suitable eye protection.

Other conditions affecting workers exposure

Indoor use

Assumes process temperature up to 40 °C

Specific conditions of use per contributing scenario

| Contributing scenario | Specific conditions of use |
|---|---|
| Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC 8b) | Covers concentrations up to 100 % Provide enclosing hood with very high effectiveness (such as fume cupboard) or effective ventilation by spray booth according to EN 16985. Ensure effectiveness is at least 95%. |

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| | |
|--|--|
| Storage (PROC 1) | Covers concentrations up to 100 % Local exhaust ventilation; No. |
| Mixing or blending in batch processes; Closed systems; Filling of articles/equipment; With sample collection (PROC 3) | Covers concentrations up to 100 % <i>Provide specifically designed and maintained LEV (fixed capturing hood type, on-tool extraction or enclosing hood type). Ensure effectiveness is at least 90%.</i> |
| Mixing or blending in batch processes; Open systems; Filling of articles/equipment; With sample collection (PROC 5) | Covers concentrations up to 100 % <i>Provide specifically designed and maintained LEV (fixed capturing hood type, on-tool extraction or enclosing hood type). Ensure effectiveness is at least 90%.</i> |
| Use as laboratory reagent (PROC 15) | Covers concentrations up to 100 % <i>Provide specifically designed and maintained LEV (fixed capturing hood type, on-tool extraction or enclosing hood type). Ensure effectiveness is at least 90%.</i> |
| Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC 9) | Covers concentrations up to 25 % <i>Provide specifically designed and maintained LEV (fixed capturing hood type, on-tool extraction or enclosing hood type). Ensure effectiveness is at least 90%.</i> |
| Equipment cleaning and maintenance (PROC 8a) | Covers concentrations up to 25 % <i>Provide specifically designed and maintained LEV (fixed capturing hood type, on-tool extraction or enclosing hood type). Ensure effectiveness is at least 90%.</i> |

1.3. Exposure estimation and reference to its source

1.3.1. Environmental release and exposure: GES 1; Formulation of fragrance compounds (mixing of fragrance substances into fragrance compounds); large/medium sites (ERC 2)

| Release route | Release rate | Release estimation method |
|---------------|--------------|---------------------------|
| Water | 0.02 kg/day | Estimated release factor |
| Air | 0.25 kg/day | ERC |
| Soil | 0 kg/day | Estimated release factor |

| Protection target | Exposure estimate | RCR |
|---|----------------------------------|--------|
| Fresh water | 6.82E-4 mg/L (EUSES 2.1.2) | 0.244 |
| Sediment (freshwater) | 0.218 mg/kg dw (EUSES 2.1.2) | 0.675 |
| Marine water | 6.81E-5 mg/L (EUSES 2.1.2) | 0.244 |
| Sediment (marine water) | 0.022 mg/kg dw (EUSES 2.1.2) | 0.677 |
| Sewage Treatment Plant | 6.8E-3 mg/L (EUSES 2.1.2) | < 0.01 |
| Agricultural soil | 0.106 mg/kg dw (EUSES 2.1.2) | 0.166 |
| Predator's prey (freshwater) | 0.208 mg/kg ww (EUSES 2.1.2) | 0.01 |
| Predator's prey (marine water) | 0.021 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Top predator's prey (marine water) | 4.46E-3 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Predator's prey (terrestrial) | 1.812 mg/kg ww (EUSES 2.1.2) | 0.091 |
| Man via environment - Inhalation (systemic effects) | 4.77E-5 mg/m³ (EUSES 2.1.2) | < 0.01 |
| Man via environment - Inhalation (local effects) | 4.77E-5 mg/m³ (EUSES 2.1.2) | < 0.01 |
| Man via environment - Oral | 0.016 mg/kg bw/day (EUSES 2.1.2) | 0.01 |
| Man via environment - combined routes | | 0.011 |

1.3.2. Environmental release and exposure: GES 1; Formulation of fragrance compounds (mixing of fragrance substances into fragrance compounds); small sites (ERC 2)

| Release route | Release rate | Release estimation method |
|---------------|--------------|---------------------------|
| Water | 4E-3 kg/day | Estimated release factor |
| Air | 0.02 kg/day | ERC |

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| | | |
|------|----------|--------------------------|
| Soil | 0 kg/day | Estimated release factor |
|------|----------|--------------------------|

| Protection target | Exposure estimate | RCR |
|---|------------------------------------|--------|
| Fresh water | 1.4E-4 mg/L (EUSES 2.1.2) | 0.05 |
| Sediment (freshwater) | 0.045 mg/kg dw (EUSES 2.1.2) | 0.139 |
| Marine water | 1.4E-5 mg/L (EUSES 2.1.2) | 0.05 |
| Sediment (marine water) | 4.47E-3 mg/kg dw (EUSES 2.1.2) | 0.139 |
| Sewage Treatment Plant | 1.36E-3 mg/L (EUSES 2.1.2) | < 0.01 |
| Agricultural soil | 0.021 mg/kg dw (EUSES 2.1.2) | 0.033 |
| Predator's prey (freshwater) | 0.045 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Predator's prey (marine water) | 4.46E-3 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Top predator's prey (marine water) | 1.2E-3 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Predator's prey (terrestrial) | 0.371 mg/kg ww (EUSES 2.1.2) | 0.019 |
| Man via environment - Inhalation (systemic effects) | 3.92E-6 mg/m³ (EUSES 2.1.2) | < 0.01 |
| Man via environment - Inhalation (local effects) | 3.92E-6 mg/m³ (EUSES 2.1.2) | < 0.01 |
| Man via environment - Oral | 3.04E-3 mg/kg bw/day (EUSES 2.1.2) | < 0.01 |
| Man via environment - combined routes | | < 0.01 |

1.3.3. Worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC 8b)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|--------------------------------------|-------|
| Inhalation, systemic, long term | 1.475 mg/m³ (TRA Workers 3.0) | 0.1 |
| Inhalation, local, long term | 1.475 mg/m³ (TRA Workers 3.0) | 0.056 |
| Dermal, systemic, long term | 0.686 mg/kg bw/day (TRA Workers 3.0) | 0.163 |
| Combined, systemic, long term | | 0.263 |

1.3.4. Worker exposure: Storage (PROC 1)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|---------------------------------------|--------|
| Inhalation, systemic, long term | 0.059 mg/m³ (TRA Workers 3.0) | < 0.01 |
| Inhalation, local, long term | 0.059 mg/m³ (TRA Workers 3.0) | < 0.01 |
| Dermal, systemic, long term | 1.7E-3 mg/kg bw/day (TRA Workers 3.0) | < 0.01 |
| Combined, systemic, long term | | < 0.01 |

1.3.5. Worker exposure: Mixing or blending in batch processes; Closed systems; Filling of articles/equipment; With sample collection (PROC 3)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|--------------------------------------|--------|
| Inhalation, systemic, long term | 1.77 mg/m³ (TRA Workers 3.0) | 0.12 |
| Inhalation, local, long term | 1.77 mg/m³ (TRA Workers 3.0) | 0.067 |
| Dermal, systemic, long term | 0.034 mg/kg bw/day (TRA Workers 3.0) | < 0.01 |
| Combined, systemic, long term | | 0.128 |

1.3.6. Worker exposure: Mixing or blending in batch processes; Open systems; Filling of articles/equipment; With sample collection (PROC 5)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|--------------------------------------|-------|
| Inhalation, systemic, long term | 2.95 mg/m³ (TRA Workers 3.0) | 0.199 |
| Inhalation, local, long term | 2.95 mg/m³ (TRA Workers 3.0) | 0.112 |
| Dermal, systemic, long term | 0.686 mg/kg bw/day (TRA Workers 3.0) | 0.163 |
| Combined, systemic, long term | | 0.363 |

1.3.7. Worker exposure: Use as laboratory reagent (PROC 15)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|--------------------------------------|--------|
| Inhalation, systemic, long term | 2.95 mg/m³ (TRA Workers 3.0) | 0.199 |
| Inhalation, local, long term | 2.95 mg/m³ (TRA Workers 3.0) | 0.112 |
| Dermal, systemic, long term | 0.017 mg/kg bw/day (TRA Workers 3.0) | < 0.01 |
| Combined, systemic, long term | | 0.203 |

1.3.8. Worker exposure: Transfer of substance or mixture into small containers (dedicated

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filling line, including weighing) (PROC 9)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|--------------------------------------|-------|
| Inhalation, systemic, long term | 1.77 mg/m³ (TRA Workers 3.0) | 0.12 |
| Inhalation, local, long term | 1.77 mg/m³ (TRA Workers 3.0) | 0.067 |
| Dermal, systemic, long term | 0.206 mg/kg bw/day (TRA Workers 3.0) | 0.049 |
| Combined, systemic, long term | | 0.169 |

1.3.9. Worker exposure: Equipment cleaning and maintenance (PROC 8a)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|--------------------------------------|-------|
| Inhalation, systemic, long term | 3.54 mg/m³ (TRA Workers 3.0) | 0.239 |
| Inhalation, local, long term | 3.54 mg/m³ (TRA Workers 3.0) | 0.134 |
| Dermal, systemic, long term | 0.411 mg/kg bw/day (TRA Workers 3.0) | 0.098 |
| Combined, systemic, long term | | 0.337 |

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

2. ES 2: Formulation or re-packing

2.1. Title section

ES name: GES 2; Formulation of fragranced end-products (mixing of fragrance compounds into fragranced end-products)

Environment

| | |
|--|-------|
| 1: GES 2; IFRA SG-1; Formulation of fragranced end-products (mixing of fragrance compounds into fragranced end-products) | ERC 2 |
| 2: GES 2; IFRA SG-2; Formulation of fragranced end-products (mixing of fragrance compounds into fragranced end-products) | ERC 2 |
| 3: GES 2; IFRA SG-3; Formulation of fragranced end-products (mixing of fragrance compounds into fragranced end-products) | ERC 2 |
| 4: GES 2; IFRA SG-4; Formulation of fragranced end-products (mixing of fragrance compounds into fragranced end-products) | ERC 2 |
| 5: GES 2; IFRA SG-5; Formulation of fragranced end-products (mixing of fragrance compounds into fragranced end-products) | ERC 2 |
| 6: GES 2; IFRA SG-6; Formulation of fragranced end-products (mixing of fragrance compounds into fragranced end-products) | ERC 2 |
| 7: GES 2; IFRA SG-7; Formulation of fragranced end-products (mixing of fragrance compounds into fragranced end-products) | ERC 2 |
| 8: GES 2; IFRA SG-8; Formulation of fragranced end-products (mixing of fragrance compounds into fragranced end-products) | ERC 2 |

Worker

| | |
|--|---------|
| 9: Transfer of substance or mixture (charging/discharging) at dedicated facilities | PROC 8b |
| 10: Use as laboratory reagent | PROC 15 |
| 11: Storage | PROC 1 |
| 12: Mixing or blending in batch processes; Closed systems; Filling of articles/equipment; With sample collection | PROC 3 |
| 13: Mixing or blending in batch processes; Open systems; Filling of articles/equipment; With sample collection | PROC 5 |
| 14: Equipment cleaning and maintenance | PROC 8a |
| 15: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) | PROC 9 |
| 16: Tableting, compression, extrusion or pelletisation | PROC 14 |

2.2. Conditions of use affecting exposure

2.2.1. Control of environmental exposure: GES 2; IFRA SG-1; Formulation of fragranced end-products (mixing of fragrance compounds into fragranced end-products) (ERC 2)

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

Daily amount per site <= 3.75E-3 tonnes/day

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| |
|--|
| Annual amount per site <= 1.125 tonnes/year |
| Conditions and measures related to biological sewage treatment plant |
| Assumed domestic sewage treatment plant flow >= 2E3 m3/day |
| Yes; application of the STP sludge on agricultural soil |
| Municipal sewage treatment plant is assumed. |
| Other conditions affecting environmental exposure |
| Receiving surface water flow >= 1.8E4 m3/day |

2.2.2. Control of environmental exposure: GES 2; IFRA SG-2; Formulation of fragranced end-products (mixing of fragrance compounds into fragranced end-products) (ERC 2)

| |
|--|
| Amount used, frequency and duration of use (or from service life) |
| Daily amount per site <= 1.37E-3 tonnes/day |
| Annual amount per site <= 0.412 tonnes/year |
| Conditions and measures related to biological sewage treatment plant |
| Assumed domestic sewage treatment plant flow >= 2E3 m3/day |
| Yes; application of the STP sludge on agricultural soil |
| Municipal sewage treatment plant is assumed. |
| Other conditions affecting environmental exposure |
| Receiving surface water flow >= 1.8E4 m3/day |

2.2.3. Control of environmental exposure: GES 2; IFRA SG-3; Formulation of fragranced end-products (mixing of fragrance compounds into fragranced end-products) (ERC 2)

| |
|--|
| Amount used, frequency and duration of use (or from service life) |
| Daily amount per site <= 2.33E-3 tonnes/day |
| Annual amount per site <= 0.35 tonnes/year |
| Conditions and measures related to biological sewage treatment plant |
| Assumed domestic sewage treatment plant flow >= 2E3 m3/day |
| Yes; application of the STP sludge on agricultural soil |
| Municipal sewage treatment plant is assumed. |
| Other conditions affecting environmental exposure |
| Receiving surface water flow >= 1.8E4 m3/day |

2.2.4. Control of environmental exposure: GES 2; IFRA SG-4; Formulation of fragranced end-products (mixing of fragrance compounds into fragranced end-products) (ERC 2)

| |
|--|
| Amount used, frequency and duration of use (or from service life) |
| Daily amount per site <= 1.04E-3 tonnes/day |
| Annual amount per site <= 0.312 tonnes/year |
| Conditions and measures related to biological sewage treatment plant |
| Assumed domestic sewage treatment plant flow >= 2E3 m3/day |
| Yes; application of the STP sludge on agricultural soil |
| Municipal sewage treatment plant is assumed. |
| Other conditions affecting environmental exposure |
| Receiving surface water flow >= 1.8E4 m3/day |

2.2.5. Control of environmental exposure: GES 2; IFRA SG-5; Formulation of fragranced end-products (mixing of fragrance compounds into fragranced end-products) (ERC 2)

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

Daily amount per site <= 4.58E-4 tonnes/day

Annual amount per site <= 0.138 tonnes/year

Conditions and measures related to biological sewage treatment plant

Assumed domestic sewage treatment plant flow >= 2E3 m3/day

Yes; application of the STP sludge on agricultural soil

Municipal sewage treatment plant is assumed.

Other conditions affecting environmental exposure

Receiving surface water flow >= 1.8E4 m3/day

2.2.6. Control of environmental exposure: GES 2; IFRA SG-6; Formulation of fragranced end-products (mixing of fragrance compounds into fragranced end-products) (ERC 2)

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

Daily amount per site <= 9.17E-4 tonnes/day

Annual amount per site <= 0.138 tonnes/year

Conditions and measures related to biological sewage treatment plant

Assumed domestic sewage treatment plant flow >= 2E3 m3/day

Yes; application of the STP sludge on agricultural soil

Municipal sewage treatment plant is assumed.

Other conditions affecting environmental exposure

Receiving surface water flow >= 1.8E4 m3/day

2.2.7. Control of environmental exposure: GES 2; IFRA SG-7; Formulation of fragranced end-products (mixing of fragrance compounds into fragranced end-products) (ERC 2)

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

Daily amount per site <= 0.03 tonnes/day

Annual amount per site <= 7.5 tonnes/year

Conditions and measures related to biological sewage treatment plant

Assumed domestic sewage treatment plant flow >= 2E3 m3/day

Yes; application of the STP sludge on agricultural soil

Municipal sewage treatment plant is assumed.

Other conditions affecting environmental exposure

Receiving surface water flow >= 1.8E4 m3/day

2.2.8. Control of environmental exposure: GES 2; IFRA SG-8; Formulation of fragranced end-products (mixing of fragrance compounds into fragranced end-products) (ERC 2)

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

Daily amount per site <= 2E-4 tonnes/day

Annual amount per site <= 0.05 tonnes/year

Conditions and measures related to biological sewage treatment plant

Assumed domestic sewage treatment plant flow >= 2E3 m3/day

Yes; application of the STP sludge on agricultural soil

Municipal sewage treatment plant is assumed.

Other conditions affecting environmental exposure

Receiving surface water flow >= 1.8E4 m3/day

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2.2.9. Control of worker exposure

Conditions of use applicable to all contributing scenarios

| |
|---|
| Product (article) characteristics |
| Liquid |
| Technical and organisational conditions and measures |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.; Ensure regular inspection, cleaning and maintenance of equipment and machines.; Clear spills immediately.; Ensure daily cleaning of the equipment. |
| Room ventilation; Basic; Up to 3 air change per hour |
| Conditions and measures related to personal protection, hygiene and health evaluation |
| Respiratory protection; No. |
| Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.; For further specification, refer to section 8 of the SDS. |
| Use suitable eye protection. |
| Other conditions affecting workers exposure |
| Indoor use |
| Assumes process temperature up to 40 °C |

Specific conditions of use per contributing scenario

| Contributing scenario | Specific conditions of use |
|--|---|
| Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC 8b) | Covers concentrations up to 25 % Covers use up to 4 h/day <i>Provide enclosing hood with very high effectiveness (such as fume cupboard) or effective ventilation by spray booth according to EN 16985. Ensure effectiveness is at least 95%.</i> |
| Use as laboratory reagent (PROC 15) | Covers concentrations up to 25 % Covers use up to 4 h/day <i>Provide specifically designed and maintained LEV (fixed capturing hood type, on-tool extraction or enclosing hood type). Ensure effectiveness is at least 90%.</i> |
| Storage (PROC 1) | Covers concentrations up to 25 % Covers use up to 4 h/day Local exhaust ventilation; No. |
| Mixing or blending in batch processes; Closed systems; Filling of articles/equipment; With sample collection (PROC 3) | Covers concentrations up to 25 % Covers use up to 4 h/day Local exhaust ventilation; No. |
| Mixing or blending in batch processes; Open systems; Filling of articles/equipment; With sample collection (PROC 5) | Covers concentrations up to 25 % Covers use up to 4 h/day <i>Provide specifically designed and maintained LEV (fixed capturing hood type, on-tool extraction or enclosing hood type). Ensure effectiveness is at least 90%.</i> |
| Equipment cleaning and maintenance (PROC 8a) | Covers concentrations up to 1 % Covers use up to 4 h/day Local exhaust ventilation; No. |
| Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC 9) | Covers concentrations up to 1 % Covers use up to 4 h/day Local exhaust ventilation; No. |
| Tabletting, compression, extrusion or pelletisation (PROC 14) | Covers concentrations up to 1 % Covers use up to 8 h/day Local exhaust ventilation; No. |

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2.3. Exposure estimation and reference to its source

2.3.1. Environmental release and exposure: GES 2; IFRA SG-1; Formulation of fragranced end-products (mixing of fragrance compounds into fragranced end-products) (ERC 2)

| Release route | Release rate | Release estimation method |
|---------------|----------------|---------------------------|
| Water | 1.87E-3 kg/day | Estimated release factor |
| Air | 3.75E-3 kg/day | Estimated release factor |
| Soil | 0 kg/day | Estimated release factor |

| Protection target | Exposure estimate | RCR |
|---|------------------------------------|--------|
| Fresh water | 6.83E-5 mg/L (EUSES 2.1.2) | 0.024 |
| Sediment (freshwater) | 0.022 mg/kg dw (EUSES 2.1.2) | 0.068 |
| Marine water | 6.79E-6 mg/L (EUSES 2.1.2) | 0.024 |
| Sediment (marine water) | 2.17E-3 mg/kg dw (EUSES 2.1.2) | 0.067 |
| Sewage Treatment Plant | 6.38E-4 mg/L (EUSES 2.1.2) | < 0.01 |
| Agricultural soil | 9.9E-3 mg/kg dw (EUSES 2.1.2) | 0.015 |
| Predator's prey (freshwater) | 0.027 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Predator's prey (marine water) | 2.68E-3 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Top predator's prey (marine water) | 8.47E-4 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Predator's prey (terrestrial) | 0.181 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Man via environment - Inhalation (systemic effects) | 9.7E-7 mg/m³ (EUSES 2.1.2) | < 0.01 |
| Man via environment - Inhalation (local effects) | 9.7E-7 mg/m³ (EUSES 2.1.2) | < 0.01 |
| Man via environment - Oral | 1.43E-3 mg/kg bw/day (EUSES 2.1.2) | < 0.01 |
| Man via environment - combined routes | | < 0.01 |

2.3.2. Environmental release and exposure: GES 2; IFRA SG-2; Formulation of fragranced end-products (mixing of fragrance compounds into fragranced end-products) (ERC 2)

| Release route | Release rate | Release estimation method |
|---------------|----------------|---------------------------|
| Water | 1.37E-3 kg/day | Estimated release factor |
| Air | 1.37E-3 kg/day | Estimated release factor |
| Soil | 0 kg/day | Estimated release factor |

| Protection target | Exposure estimate | RCR |
|---|------------------------------------|--------|
| Fresh water | 5.14E-5 mg/L (EUSES 2.1.2) | 0.018 |
| Sediment (freshwater) | 0.016 mg/kg dw (EUSES 2.1.2) | 0.051 |
| Marine water | 5.1E-6 mg/L (EUSES 2.1.2) | 0.018 |
| Sediment (marine water) | 1.63E-3 mg/kg dw (EUSES 2.1.2) | 0.051 |
| Sewage Treatment Plant | 4.68E-4 mg/L (EUSES 2.1.2) | < 0.01 |
| Agricultural soil | 7.26E-3 mg/kg dw (EUSES 2.1.2) | 0.011 |
| Predator's prey (freshwater) | 0.021 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Predator's prey (marine water) | 2.07E-3 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Top predator's prey (marine water) | 7.25E-4 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Predator's prey (terrestrial) | 0.136 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Man via environment - Inhalation (systemic effects) | 4.27E-7 mg/m³ (EUSES 2.1.2) | < 0.01 |
| Man via environment - Inhalation (local effects) | 4.27E-7 mg/m³ (EUSES 2.1.2) | < 0.01 |
| Man via environment - Oral | 1.04E-3 mg/kg bw/day (EUSES 2.1.2) | < 0.01 |
| Man via environment - combined routes | | < 0.01 |

2.3.3. Environmental release and exposure: GES 2; IFRA SG-3; Formulation of fragranced end-products (mixing of fragrance compounds into fragranced end-products) (ERC 2)

| Release route | Release rate | Release estimation method |
|---------------|--------------|---------------------------|
|---------------|--------------|---------------------------|

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|--------------|----------------|--------------------------|
| Water | 4.66E-3 kg/day | Estimated release factor |
| Air | 2.33E-3 kg/day | Estimated release factor |
| Soil | 0 kg/day | Estimated release factor |

| Protection target | Exposure estimate | RCR |
|---|-----------------------------------|--------|
| Fresh water | 1.63E-4 mg/L (EUSES 2.1.2) | 0.058 |
| Sediment (freshwater) | 0.052 mg/kg dw (EUSES 2.1.2) | 0.161 |
| Marine water | 1.62E-5 mg/L (EUSES 2.1.2) | 0.058 |
| Sediment (marine water) | 5.19E-3 mg/kg dw (EUSES 2.1.2) | 0.161 |
| Sewage Treatment Plant | 1.58E-3 mg/L (EUSES 2.1.2) | < 0.01 |
| Agricultural soil | 0.025 mg/kg dw (EUSES 2.1.2) | 0.038 |
| Predator's prey (freshwater) | 0.033 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Predator's prey (marine water) | 3.24E-3 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Top predator's prey (marine water) | 9.59E-4 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Predator's prey (terrestrial) | 0.429 mg/kg ww (EUSES 2.1.2) | 0.021 |
| Man via environment - Inhalation (systemic effects) | 3.8E-7 mg/m³ (EUSES 2.1.2) | < 0.01 |
| Man via environment - Inhalation (local effects) | 3.8E-7 mg/m³ (EUSES 2.1.2) | < 0.01 |
| Man via environment - Oral | 3.4E-3 mg/kg bw/day (EUSES 2.1.2) | < 0.01 |
| Man via environment - combined routes | | < 0.01 |

2.3.4. Environmental release and exposure: GES 2; IFRA SG-4; Formulation of fragranced end-products (mixing of fragrance compounds into fragranced end-products) (ERC 2)

| Release route | Release rate | Release estimation method |
|---------------|----------------|---------------------------|
| Water | 1.04E-3 kg/day | Estimated release factor |
| Air | 0 kg/day | Estimated release factor |
| Soil | 0 kg/day | Estimated release factor |

| Protection target | Exposure estimate | RCR |
|---|------------------------------------|--------|
| Fresh water | 4.01E-5 mg/L (EUSES 2.1.2) | 0.014 |
| Sediment (freshwater) | 0.013 mg/kg dw (EUSES 2.1.2) | 0.04 |
| Marine water | 3.97E-6 mg/L (EUSES 2.1.2) | 0.014 |
| Sediment (marine water) | 1.27E-3 mg/kg dw (EUSES 2.1.2) | 0.039 |
| Sewage Treatment Plant | 3.54E-4 mg/L (EUSES 2.1.2) | < 0.01 |
| Agricultural soil | 5.5E-3 mg/kg dw (EUSES 2.1.2) | < 0.01 |
| Predator's prey (freshwater) | 0.017 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Predator's prey (marine water) | 1.66E-3 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Top predator's prey (marine water) | 6.44E-4 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Predator's prey (terrestrial) | 0.106 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Man via environment - Inhalation (systemic effects) | 1.24E-7 mg/m³ (EUSES 2.1.2) | < 0.01 |
| Man via environment - Inhalation (local effects) | 1.24E-7 mg/m³ (EUSES 2.1.2) | < 0.01 |
| Man via environment - Oral | 7.88E-4 mg/kg bw/day (EUSES 2.1.2) | < 0.01 |
| Man via environment - combined routes | | < 0.01 |

2.3.5. Environmental release and exposure: GES 2; IFRA SG-5; Formulation of fragranced end-products (mixing of fragrance compounds into fragranced end-products) (ERC 2)

| Release route | Release rate | Release estimation method |
|---------------|----------------|---------------------------|
| Water | 9.16E-4 kg/day | Estimated release factor |
| Air | 0 kg/day | Estimated release factor |

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|-------------|----------|--------------------------|
| Soil | 0 kg/day | Estimated release factor |
|-------------|----------|--------------------------|

| Protection target | Exposure estimate | RCR |
|---|------------------------------------|--------|
| Fresh water | 3.59E-5 mg/L (EUSES 2.1.2) | 0.013 |
| Sediment (freshwater) | 0.011 mg/kg dw (EUSES 2.1.2) | 0.036 |
| Marine water | 3.54E-6 mg/L (EUSES 2.1.2) | 0.013 |
| Sediment (marine water) | 1.13E-3 mg/kg dw (EUSES 2.1.2) | 0.035 |
| Sewage Treatment Plant | 3.11E-4 mg/L (EUSES 2.1.2) | < 0.01 |
| Agricultural soil | 4.83E-3 mg/kg dw (EUSES 2.1.2) | < 0.01 |
| Predator's prey (freshwater) | 0.015 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Predator's prey (marine water) | 1.51E-3 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Top predator's prey (marine water) | 6.13E-4 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Predator's prey (terrestrial) | 0.095 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Man via environment - Inhalation (systemic effects) | 1.23E-7 mg/m³ (EUSES 2.1.2) | < 0.01 |
| Man via environment - Inhalation (local effects) | 1.23E-7 mg/m³ (EUSES 2.1.2) | < 0.01 |
| Man via environment - Oral | 6.94E-4 mg/kg bw/day (EUSES 2.1.2) | < 0.01 |
| Man via environment - combined routes | | < 0.01 |

2.3.6. Environmental release and exposure: GES 2; IFRA SG-6; Formulation of fragranced end-products (mixing of fragrance compounds into fragranced end-products) (ERC 2)

| Release route | Release rate | Release estimation method |
|---------------|----------------|---------------------------|
| Water | 3.67E-3 kg/day | Estimated release factor |
| Air | 0 kg/day | Estimated release factor |
| Soil | 0 kg/day | Estimated release factor |

| Protection target | Exposure estimate | RCR |
|---|------------------------------------|--------|
| Fresh water | 1.29E-4 mg/L (EUSES 2.1.2) | 0.046 |
| Sediment (freshwater) | 0.041 mg/kg dw (EUSES 2.1.2) | 0.128 |
| Marine water | 1.29E-5 mg/L (EUSES 2.1.2) | 0.046 |
| Sediment (marine water) | 4.11E-3 mg/kg dw (EUSES 2.1.2) | 0.128 |
| Sewage Treatment Plant | 1.25E-3 mg/L (EUSES 2.1.2) | < 0.01 |
| Agricultural soil | 0.019 mg/kg dw (EUSES 2.1.2) | 0.03 |
| Predator's prey (freshwater) | 0.027 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Predator's prey (marine water) | 2.63E-3 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Top predator's prey (marine water) | 8.37E-4 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Predator's prey (terrestrial) | 0.341 mg/kg ww (EUSES 2.1.2) | 0.017 |
| Man via environment - Inhalation (systemic effects) | 1.32E-7 mg/m³ (EUSES 2.1.2) | < 0.01 |
| Man via environment - Inhalation (local effects) | 1.32E-7 mg/m³ (EUSES 2.1.2) | < 0.01 |
| Man via environment - Oral | 2.67E-3 mg/kg bw/day (EUSES 2.1.2) | < 0.01 |
| Man via environment - combined routes | | < 0.01 |

2.3.7. Environmental release and exposure: GES 2; IFRA SG-7; Formulation of fragranced end-products (mixing of fragrance compounds into fragranced end-products) (ERC 2)

| Release route | Release rate | Release estimation method |
|---------------|--------------|---------------------------|
| Water | 0 kg/day | Estimated release factor |
| Air | 0 kg/day | Estimated release factor |
| Soil | 0 kg/day | Estimated release factor |

| Protection target | Exposure estimate | RCR |
|-------------------|----------------------------|--------|
| Fresh water | 4.87E-6 mg/L (EUSES 2.1.2) | < 0.01 |

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| Sediment (freshwater) | 1.56E-3 mg/kg dw (EUSES 2.1.2) | < 0.01 |
| Marine water | 4.44E-7 mg/L (EUSES 2.1.2) | < 0.01 |
| Sediment (marine water) | 1.42E-4 mg/kg dw (EUSES 2.1.2) | < 0.01 |
| Sewage Treatment Plant | 0 mg/L (EUSES 2.1.2) | < 0.01 |
| Agricultural soil | 9.17E-6 mg/kg dw (EUSES 2.1.2) | < 0.01 |
| Predator's prey (freshwater) | 4.28E-3 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Predator's prey (marine water) | 3.9E-4 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Top predator's prey (marine water) | 3.9E-4 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Predator's prey (terrestrial) | 0.013 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Man via environment - Inhalation (systemic effects) | 1.13E-7 mg/m³ (EUSES 2.1.2) | < 0.01 |
| Man via environment - Inhalation (local effects) | 1.13E-7 mg/m³ (EUSES 2.1.2) | < 0.01 |
| Man via environment - Oral | 1.02E-5 mg/kg bw/day (EUSES 2.1.2) | < 0.01 |
| Man via environment - combined routes | | < 0.01 |

2.3.8. Environmental release and exposure: GES 2; IFRA SG-8; Formulation of fragranced end-products (mixing of fragrance compounds into fragranced end-products) (ERC 2)

| Release route | Release rate | Release estimation method |
|---------------|--------------|---------------------------|
| Water | 4E-3 kg/day | Estimated release factor |
| Air | 0 kg/day | Estimated release factor |
| Soil | 0 kg/day | Estimated release factor |

| Protection target | Exposure estimate | RCR |
|---|------------------------------------|--------|
| Fresh water | 1.4E-4 mg/L (EUSES 2.1.2) | 0.05 |
| Sediment (freshwater) | 0.045 mg/kg dw (EUSES 2.1.2) | 0.139 |
| Marine water | 1.4E-5 mg/L (EUSES 2.1.2) | 0.05 |
| Sediment (marine water) | 4.47E-3 mg/kg dw (EUSES 2.1.2) | 0.139 |
| Sewage Treatment Plant | 1.36E-3 mg/L (EUSES 2.1.2) | < 0.01 |
| Agricultural soil | 0.021 mg/kg dw (EUSES 2.1.2) | 0.033 |
| Predator's prey (freshwater) | 0.045 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Predator's prey (marine water) | 4.46E-3 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Top predator's prey (marine water) | 1.2E-3 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Predator's prey (terrestrial) | 0.37 mg/kg ww (EUSES 2.1.2) | 0.019 |
| Man via environment - Inhalation (systemic effects) | 1.48E-7 mg/m³ (EUSES 2.1.2) | < 0.01 |
| Man via environment - Inhalation (local effects) | 1.48E-7 mg/m³ (EUSES 2.1.2) | < 0.01 |
| Man via environment - Oral | 2.97E-3 mg/kg bw/day (EUSES 2.1.2) | < 0.01 |
| Man via environment - combined routes | | < 0.01 |

2.3.9. Worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC 8b)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|--------------------------------------|-------|
| Inhalation, systemic, long term | 0.885 mg/m³ (TRA Workers 3.0) | 0.06 |
| Inhalation, local, long term | 0.885 mg/m³ (TRA Workers 3.0) | 0.033 |
| Dermal, systemic, long term | 0.411 mg/kg bw/day (TRA Workers 3.0) | 0.098 |
| Combined, systemic, long term | | 0.158 |

2.3.10. Worker exposure: Use as laboratory reagent (PROC 15)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|-------------------------------------|--------|
| Inhalation, systemic, long term | 1.77 mg/m³ (TRA Workers 3.0) | 0.12 |
| Inhalation, local, long term | 1.77 mg/m³ (TRA Workers 3.0) | 0.067 |
| Dermal, systemic, long term | 0.01 mg/kg bw/day (TRA Workers 3.0) | < 0.01 |
| Combined, systemic, long term | | 0.122 |

2.3.11. Worker exposure: Storage (PROC 1)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|-------------------|-----|
|---------------------------------------|-------------------|-----|

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|---------------------------------|--|--------|
| Inhalation, systemic, long term | 0.035 mg/m³ (TRA Workers 3.0) | < 0.01 |
| Inhalation, local, long term | 0.035 mg/m³ (TRA Workers 3.0) | < 0.01 |
| Dermal, systemic, long term | 1.02E-3 mg/kg bw/day (TRA Workers 3.0) | < 0.01 |
| Combined, systemic, long term | | < 0.01 |

2.3.12. Worker exposure: Mixing or blending in batch processes; Closed systems; Filling of articles/equipment; With sample collection (PROC 3)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|--------------------------------------|--------|
| Inhalation, systemic, long term | 10.62 mg/m³ (TRA Workers 3.0) | 0.718 |
| Inhalation, local, long term | 10.62 mg/m³ (TRA Workers 3.0) | 0.402 |
| Dermal, systemic, long term | 0.021 mg/kg bw/day (TRA Workers 3.0) | < 0.01 |
| Combined, systemic, long term | | 0.722 |

2.3.13. Worker exposure: Mixing or blending in batch processes; Open systems; Filling of articles/equipment; With sample collection (PROC 5)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|--------------------------------------|-------|
| Inhalation, systemic, long term | 1.77 mg/m³ (TRA Workers 3.0) | 0.12 |
| Inhalation, local, long term | 1.77 mg/m³ (TRA Workers 3.0) | 0.067 |
| Dermal, systemic, long term | 0.411 mg/kg bw/day (TRA Workers 3.0) | 0.098 |
| Combined, systemic, long term | | 0.218 |

2.3.14. Worker exposure: Equipment cleaning and maintenance (PROC 8a)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|--------------------------------------|-------|
| Inhalation, systemic, long term | 5.9 mg/m³ (TRA Workers 3.0) | 0.399 |
| Inhalation, local, long term | 5.9 mg/m³ (TRA Workers 3.0) | 0.223 |
| Dermal, systemic, long term | 0.069 mg/kg bw/day (TRA Workers 3.0) | 0.016 |
| Combined, systemic, long term | | 0.415 |

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

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|--------------------------------------|--------|
| Inhalation, systemic, long term | 2.95 mg/m³ (TRA Workers 3.0) | 0.199 |
| Inhalation, local, long term | 2.95 mg/m³ (TRA Workers 3.0) | 0.112 |
| Dermal, systemic, long term | 0.034 mg/kg bw/day (TRA Workers 3.0) | < 0.01 |
| Combined, systemic, long term | | 0.207 |

2.3.16. Worker exposure: Tableting, compression, extrusion or pelletisation (PROC 14)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|--------------------------------------|--------|
| Inhalation, systemic, long term | 4.917 mg/m³ (TRA Workers 3.0) | 0.332 |
| Inhalation, local, long term | 4.917 mg/m³ (TRA Workers 3.0) | 0.186 |
| Dermal, systemic, long term | 0.017 mg/kg bw/day (TRA Workers 3.0) | < 0.01 |
| Combined, systemic, long term | | 0.336 |

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

3. ES 3: Widespread use by professional workers; Various products (PC 8, PC 35)

3.1. Title section

ES name: GES 3; Professional end-use of washing, cleaning and disinfecting products (including use at industrial sites)

Product category: Biocidal Products (PC 8), Washing and Cleaning Products (PC 35)

| | |
|---|-------|
| Environment | SPERC |
| 1: GES 3; Professional end-use of washing, cleaning and disinfecting products (including use at | |

ERC 8a

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| | | |
|---|------------------|---------------------|
| Industrial sites) | | |
| Worker | SWED | |
| 2: Chemical production or refinery in closed process without likelihood of exposure or processes with PROC 1 equivalent containment conditions | | |
| 3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition | PROC 3 | AISE_SWED_PW_3_1 |
| 4: Chemical production where opportunity for exposure arises | PROC 4 | AISE_SWED_PW_4_1 |
| 5: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities; Liquids | PROC 8a, PROC 28 | AISE_SWED_PW_8a_2_L |
| 6: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities; Solid | PROC 8a, PROC 28 | AISE_SWED_PW_8a_2_S |
| 7: Transfer of substance or mixture (charging/discharging) at dedicated facilities | PROC 8b | AISE_SWED_PW_8b_1 |
| 8: Roller application or brushing | PROC 10 | |
| 9: Non-industrial spraying; for up to 1 hour | PROC 11 | |
| 10: Non-industrial spraying; for up to 8 hours | PROC 11 | |
| 11: Treatment of articles by dipping and pouring; for up to 1 hour | PROC 13 | AISE_SWED_PW_13_2 |
| 12: Treatment of articles by dipping and pouring; for up to 15 minutes | PROC 13 | AISE_SWED_PW_13_3 |
| 13: Manual activities involving hand contact | PROC 19 | |

3.2. Conditions of use affecting exposure

3.2.1. Control of environmental exposure: GES 3; Professional end-use of washing, cleaning and disinfecting products (including use at industrial sites) (ERC 8a)

| |
|---|
| Conditions and measures related to biological sewage treatment plant |
| Municipal sewage treatment plant is assumed. |

3.2.2. Control of worker exposure

Conditions of use applicable to all contributing scenarios

| |
|--|
| Product (article) characteristics |
| Covers concentrations up to 1 % |
| Technical and organisational conditions and measures |
| Occupational Health and Safety Management System; Basic |
| Conditions and measures related to personal protection, hygiene and health evaluation |
| Face/eye protection; No. |
| Other conditions affecting workers exposure |
| Indoor use |
| Assumes process temperature up to 25 °C |

Specific conditions of use per contributing scenario

| Contributing scenario | Specific conditions of use |
|--|---|
| Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC 1) | Liquid Covers use up to 8 h/day Room ventilation; Basic; Up to 3 air change per hour Local exhaust ventilation; No. Respiratory protection; No. Wear suitable gloves tested to EN374.; If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.; For further specification, refer to section 8 of the SDS. |
| Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled | Liquid Covers use up to 8 h/day Room ventilation; Basic; Up to 3 air change per hour |

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|--|---|
| exposure or processes with equivalent containment condition (PROC 3) | Local exhaust ventilation; No. Respiratory protection; No. dermal; Personal protection; No. |
| Chemical production where opportunity for exposure arises (PROC 4) | Liquid Covers use up to 8 h/day Room ventilation; Basic; Up to 3 air change per hour Local exhaust ventilation; No. Respiratory protection; No. dermal; Personal protection; No. |
| Transfer of substance or mixture (charging/discharging) at non dedicated-facilities; Liquids (PROC 8a, PROC 28) | Liquid Covers use up to 1 h/day Room ventilation; Basic; Up to 3 air change per hour Local exhaust ventilation; No. Respiratory protection; No. dermal; Personal protection; No. |
| Transfer of substance or mixture (charging/discharging) at non dedicated-facilities; Solid (PROC 8a, PROC 28) | Solid; High dustiness: Handling the product in its dry form results in a dust cloud that is clearly visible for some time. For example, talcum powder. Covers use up to 1 h/day Room ventilation; Basic; Up to 3 air change per hour Local exhaust ventilation; No. Respiratory protection; No. dermal; Personal protection; No. |
| Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC 8b) | Liquid Covers use up to 1 h/day Room ventilation; Basic; Up to 3 air change per hour Local exhaust ventilation; No. Respiratory protection; No. dermal; Personal protection; No. |
| Roller application or brushing (PROC 10) | Liquid Covers use up to 8 h/day Room ventilation; Basic; Up to 3 air change per hour <i>Provide specifically designed and maintained LEV (receiving hood type). Ensure effectiveness is at least 80%.</i> Respiratory protection; No. dermal; Personal protection; No. |
| Non-industrial spraying; for up to 1 hour (PROC 11) | Liquid Covers use up to 1 h/day Room ventilation; Basic; Up to 3 air change per hour <i>Provide specifically designed and maintained LEV (receiving hood type). Ensure effectiveness is at least 80%.</i> Respiratory protection; No. Wear suitable gloves tested to EN374.; If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.; For further specification, refer to section 8 of the SDS. |
| Non-industrial spraying; for up to 8 hours (PROC 11) | Liquid Covers use up to 8 h/day Room ventilation; Basic; Up to 3 air change per hour Local exhaust ventilation; No. <i>Wear a respirator which reduces the air impurities by at least a factor of 10 (APF >= 10). For further specification, refer to section 8 of the SDS</i> Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.; If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.; For further specification, refer to section 8 of the SDS. |
| Treatment of articles by dipping and pouring; for up to 1 hour (PROC 13) | Liquid Covers use up to 1 h/day Room ventilation; Basic; Up to 3 air change per hour Local exhaust ventilation; No. Respiratory protection; No. dermal; Personal protection; No. |
| Treatment of articles by dipping and | Liquid |

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| pouring; for up to 15 minutes (PROC 13) | Covers use up to 0.25 h/day Room ventilation; Basic; Up to 3 air change per hour Local exhaust ventilation; No. Respiratory protection; No. Wear suitable gloves tested to EN374.; For further specification, refer to section 8 of the SDS. |
| Manual activities involving hand contact (PROC 19) | Liquid Covers use up to 8 h/day Room ventilation; Up to 3 air change per hour <i>Provide specifically designed and maintained LEV (receiving hood type). Ensure effectiveness is at least 80%.</i> Respiratory protection; No. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.; If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.; For further specification, refer to section 8 of the SDS. |

3.3. Exposure estimation and reference to its source**3.3.1. Environmental release and exposure: GES 3; Professional end-use of washing, cleaning and disinfecting products (including use at industrial sites) (ERC 8a)**

| Release route | Release rate | Release estimation method |
|---------------|--------------|---------------------------|
| Water | 0 kg/day | ERC |
| Air | 0 kg/day | ERC |
| Soil | 0 kg/day | ERC |

| Protection target | Exposure estimate | RCR |
|---|------------------------------------|--------|
| Fresh water | 4.87E-6 mg/L (EUSES 2.1.2) | < 0.01 |
| Sediment (freshwater) | 1.56E-3 mg/kg dw (EUSES 2.1.2) | < 0.01 |
| Marine water | 4.44E-7 mg/L (EUSES 2.1.2) | < 0.01 |
| Sediment (marine water) | 1.42E-4 mg/kg dw (EUSES 2.1.2) | < 0.01 |
| Sewage Treatment Plant | 0 mg/L (EUSES 2.1.2) | < 0.01 |
| Agricultural soil | 9.17E-6 mg/kg dw (EUSES 2.1.2) | < 0.01 |
| Predator's prey (freshwater) | 4.28E-3 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Predator's prey (marine water) | 3.9E-4 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Top predator's prey (marine water) | 3.9E-4 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Predator's prey (terrestrial) | 0.013 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Man via environment - Inhalation (systemic effects) | 1.13E-7 mg/m³ (EUSES 2.1.2) | < 0.01 |
| Man via environment - Inhalation (local effects) | 1.13E-7 mg/m³ (EUSES 2.1.2) | < 0.01 |
| Man via environment - Oral | 1.02E-5 mg/kg bw/day (EUSES 2.1.2) | < 0.01 |
| Man via environment - combined routes | | < 0.01 |

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

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|---------------------------------------|--------|
| Inhalation, systemic, long term | 9.83E-3 mg/m³ (TRA Workers 3.0) | < 0.01 |
| Inhalation, local, long term | 9.83E-3 mg/m³ (TRA Workers 3.0) | < 0.01 |
| Dermal, systemic, long term | 6.8E-4 mg/kg bw/day (TRA Workers 3.0) | < 0.01 |
| Combined, systemic, long term | | < 0.01 |

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

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|------------------------------|-------|
| Inhalation, systemic, long term | 2.95 mg/m³ (TRA Workers 3.0) | 0.199 |
| Inhalation, local, long term | 2.95 mg/m³ (TRA Workers 3.0) | 0.112 |

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|-------------------------------|--------------------------------------|-------|
| Dermal, systemic, long term | 0.069 mg/kg bw/day (TRA Workers 3.0) | 0.016 |
| Combined, systemic, long term | | 0.216 |

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

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|---|-------|
| Inhalation, systemic, long term | 9.833 mg/m ³ (TRA Workers 3.0) | 0.664 |
| Inhalation, local, long term | 9.833 mg/m ³ (TRA Workers 3.0) | 0.372 |
| Dermal, systemic, long term | 0.686 mg/kg bw/day (TRA Workers 3.0) | 0.163 |
| Combined, systemic, long term | | 0.828 |

3.3.5. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities; Liquids (PROC 8a, PROC 28)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|---|-------|
| Inhalation, systemic, long term | 4.917 mg/m ³ (TRA Workers 3.0) | 0.332 |
| Inhalation, local, long term | 4.917 mg/m ³ (TRA Workers 3.0) | 0.186 |
| Dermal, systemic, long term | 1.371 mg/kg bw/day (TRA Workers 3.0) | 0.326 |
| Combined, systemic, long term | | 0.659 |

3.3.6. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities; Solid (PROC 8a, PROC 28)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|---|-------|
| Inhalation, systemic, long term | 4.917 mg/m ³ (TRA Workers 3.0) | 0.332 |
| Inhalation, local, long term | 4.917 mg/m ³ (TRA Workers 3.0) | 0.186 |
| Dermal, systemic, long term | 1.371 mg/kg bw/day (TRA Workers 3.0) | 0.326 |
| Combined, systemic, long term | | 0.659 |

3.3.7. Worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC 8b)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|---|-------|
| Inhalation, systemic, long term | 1.967 mg/m ³ (TRA Workers 3.0) | 0.133 |
| Inhalation, local, long term | 1.967 mg/m ³ (TRA Workers 3.0) | 0.074 |
| Dermal, systemic, long term | 1.371 mg/kg bw/day (TRA Workers 3.0) | 0.326 |
| Combined, systemic, long term | | 0.459 |

3.3.8. Worker exposure: Roller application or brushing (PROC 10)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|---|-------|
| Inhalation, systemic, long term | 4.917 mg/m ³ (TRA Workers 3.0) | 0.332 |
| Inhalation, local, long term | 4.917 mg/m ³ (TRA Workers 3.0) | 0.186 |
| Dermal, systemic, long term | 2.743 mg/kg bw/day (TRA Workers 3.0) | 0.653 |
| Combined, systemic, long term | | 0.985 |

3.3.9. Worker exposure: Non-industrial spraying; for up to 1 hour (PROC 11)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|---|-------|
| Inhalation, systemic, long term | 3.933 mg/m ³ (TRA Workers 3.0) | 0.266 |
| Inhalation, local, long term | 3.933 mg/m ³ (TRA Workers 3.0) | 0.149 |
| Dermal, systemic, long term | 2.143 mg/kg bw/day (TRA Workers 3.0) | 0.51 |
| Combined, systemic, long term | | 0.776 |

3.3.10. Worker exposure: Non-industrial spraying; for up to 8 hours (PROC 11)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|---|-------|
| Inhalation, systemic, long term | 9.833 mg/m ³ (TRA Workers 3.0) | 0.664 |
| Inhalation, local, long term | 9.833 mg/m ³ (TRA Workers 3.0) | 0.372 |
| Dermal, systemic, long term | 1.071 mg/kg bw/day (TRA Workers 3.0) | 0.255 |
| Combined, systemic, long term | | 0.92 |

3.3.11. Worker exposure: Treatment of articles by dipping and pouring; for up to 1 hour (PROC 13)

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| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|--------------------------------------|-------|
| Inhalation, systemic, long term | 1.967 mg/m³ (TRA Workers 3.0) | 0.133 |
| Inhalation, local, long term | 1.967 mg/m³ (TRA Workers 3.0) | 0.074 |
| Dermal, systemic, long term | 1.371 mg/kg bw/day (TRA Workers 3.0) | 0.326 |
| Combined, systemic, long term | | 0.459 |

3.3.12. Worker exposure: Treatment of articles by dipping and pouring; for up to 15 minutes (PROC 13)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|--------------------------------------|-------|
| Inhalation, systemic, long term | 0.983 mg/m³ (TRA Workers 3.0) | 0.066 |
| Inhalation, local, long term | 0.983 mg/m³ (TRA Workers 3.0) | 0.037 |
| Dermal, systemic, long term | 0.274 mg/kg bw/day (TRA Workers 3.0) | 0.065 |
| Combined, systemic, long term | | 0.132 |

3.3.13. Worker exposure: Manual activities involving hand contact (PROC 19)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|--------------------------------------|-------|
| Inhalation, systemic, long term | 4.917 mg/m³ (TRA Workers 3.0) | 0.332 |
| Inhalation, local, long term | 4.917 mg/m³ (TRA Workers 3.0) | 0.186 |
| Dermal, systemic, long term | 1.414 mg/kg bw/day (TRA Workers 3.0) | 0.337 |
| Combined, systemic, long term | | 0.669 |

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

4. ES 4: Widespread use by professional workers; Polishes and Wax Blends; Various sectors

4.1. Title section

ES name: GES 4; Professional end-use of polishes and wax blends

Product category: Polishes and Wax Blends (PC 31)

Sector of use: Manufacture of textiles, leather, fur (SU 5), Manufacture of wood and wood products (SU 6a), Manufacture of furniture (SU 18)

| Environment | SPERC | |
|--|------------------|---------------------|
| 1: GES 4; Professional end-use of polishes and wax blends | ERC 8a | |
| Worker | SWED | |
| 2: Chemical production or refinery in closed process without likelihood of exposure or processes with PROC 1 equivalent containment conditions | AISE_SWED_PW_1_1 | |
| 3: Chemical production where opportunity for exposure arises | PROC 4 | AISE_SWED_PW_4_1 |
| 4: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities | PROC 8a | AISE_SWED_PW_8a_2_S |
| 5: Roller application or brushing | PROC 10 | |
| 6: Treatment of articles by dipping and pouring; for up to 1 hour | PROC 13 | AISE_SWED_PW_13_2 |
| 7: Treatment of articles by dipping and pouring; for up to 15 minutes | PROC 13 | AISE_SWED_PW_13_3 |
| 8: Manual activities involving hand contact | PROC 19 | |

4.2. Conditions of use affecting exposure

4.2.1. Control of environmental exposure: GES 4; Professional end-use of polishes and wax blends (ERC 8a)

| Conditions and measures related to biological sewage treatment plant |
|--|
| Municipal sewage treatment plant is assumed. |

4.2.2. Control of worker exposure

Conditions of use applicable to all contributing scenarios

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Product (article) characteristics

Covers concentrations up to 1 %

Technical and organisational conditions and measures

Occupational Health and Safety Management System; Basic

Room ventilation; Basic; Up to 3 air change per hour

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

Face/eye protection; No.

Respiratory protection; No.

Other conditions affecting workers exposure

Indoor use

Assumes process temperature up to 25 °C

Specific conditions of use per contributing scenario

| Contributing scenario | Specific conditions of use |
|---|--|
| Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC 1) | Liquid Covers use up to 8 h/day Local exhaust ventilation; No. dermal; Personal protection; No. |
| Chemical production where opportunity for exposure arises (PROC 4) | Liquid Covers use up to 8 h/day Local exhaust ventilation; No. dermal; Personal protection; No. |
| Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC 8a) | Solid; High dustiness: Handling the product in its dry form results in a dust cloud that is clearly visible for some time. For example, talcum powder. Covers use up to 1 h/day Local exhaust ventilation; No. dermal; Personal protection; No. |
| Roller application or brushing (PROC 10) | Liquid Covers use up to 8 h/day <i>Provide specifically designed and maintained LEV (receiving hood type). Ensure effectiveness is at least 80%.</i> dermal; Personal protection; No. |
| Treatment of articles by dipping and pouring; for up to 1 hour (PROC 13) | Liquid Covers use up to 1 h/day Local exhaust ventilation; No. dermal; Personal protection; No. |
| Treatment of articles by dipping and pouring; for up to 15 minutes (PROC 13) | Liquid Covers use up to 0.25 h/day Local exhaust ventilation; No. Wear suitable gloves tested to EN374.; For further specification, refer to section 8 of the SDS. |
| Manual activities involving hand contact (PROC 19) | Liquid Covers use up to 8 h/day <i>Provide specifically designed and maintained LEV (receiving hood type). Ensure effectiveness is at least 80%.</i> Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.; If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.; For further specification, refer to section 8 of the SDS. |

4.3. Exposure estimation and reference to its source

4.3.1. Environmental release and exposure: GES 4; Professional end-use of polishes and wax blends (ERC 8a)

| Release route | Release rate | Release estimation method |
|---------------|--------------|---------------------------|
|---------------|--------------|---------------------------|

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| | | |
|--------------|----------|-----|
| Water | 0 kg/day | ERC |
| Air | 0 kg/day | ERC |
| Soil | 0 kg/day | ERC |

| Protection target | Exposure estimate | RCR |
|---|------------------------------------|--------|
| Fresh water | 4.87E-6 mg/L (EUSES 2.1.2) | < 0.01 |
| Sediment (freshwater) | 1.56E-3 mg/kg dw (EUSES 2.1.2) | < 0.01 |
| Marine water | 4.44E-7 mg/L (EUSES 2.1.2) | < 0.01 |
| Sediment (marine water) | 1.42E-4 mg/kg dw (EUSES 2.1.2) | < 0.01 |
| Sewage Treatment Plant | 0 mg/L (EUSES 2.1.2) | < 0.01 |
| Agricultural soil | 9.17E-6 mg/kg dw (EUSES 2.1.2) | < 0.01 |
| Predator's prey (freshwater) | 4.28E-3 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Predator's prey (marine water) | 3.9E-4 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Top predator's prey (marine water) | 3.9E-4 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Predator's prey (terrestrial) | 0.013 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Man via environment - Inhalation (systemic effects) | 1.13E-7 mg/m³ (EUSES 2.1.2) | < 0.01 |
| Man via environment - Inhalation (local effects) | 1.13E-7 mg/m³ (EUSES 2.1.2) | < 0.01 |
| Man via environment - Oral | 1.02E-5 mg/kg bw/day (EUSES 2.1.2) | < 0.01 |
| Man via environment - combined routes | | < 0.01 |

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

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|---------------------------------------|--------|
| Inhalation, systemic, long term | 9.83E-3 mg/m³ (TRA Workers 3.0) | < 0.01 |
| Inhalation, local, long term | 9.83E-3 mg/m³ (TRA Workers 3.0) | < 0.01 |
| Dermal, systemic, long term | 3.4E-3 mg/kg bw/day (TRA Workers 3.0) | < 0.01 |
| Combined, systemic, long term | | < 0.01 |

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

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|--------------------------------------|-------|
| Inhalation, systemic, long term | 9.833 mg/m³ (TRA Workers 3.0) | 0.664 |
| Inhalation, local, long term | 9.833 mg/m³ (TRA Workers 3.0) | 0.372 |
| Dermal, systemic, long term | 0.686 mg/kg bw/day (TRA Workers 3.0) | 0.163 |
| Combined, systemic, long term | | 0.828 |

4.3.4. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC 8a)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|--------------------------------------|-------|
| Inhalation, systemic, long term | 4.917 mg/m³ (TRA Workers 3.0) | 0.332 |
| Inhalation, local, long term | 4.917 mg/m³ (TRA Workers 3.0) | 0.186 |
| Dermal, systemic, long term | 1.371 mg/kg bw/day (TRA Workers 3.0) | 0.326 |
| Combined, systemic, long term | | 0.659 |

4.3.5. Worker exposure: Roller application or brushing (PROC 10)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|--------------------------------------|-------|
| Inhalation, systemic, long term | 4.917 mg/m³ (TRA Workers 3.0) | 0.332 |
| Inhalation, local, long term | 4.917 mg/m³ (TRA Workers 3.0) | 0.186 |
| Dermal, systemic, long term | 2.743 mg/kg bw/day (TRA Workers 3.0) | 0.653 |
| Combined, systemic, long term | | 0.985 |

4.3.6. Worker exposure: Treatment of articles by dipping and pouring; for up to 1 hour (PROC 13)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|-------------------------------|-------|
| Inhalation, systemic, long term | 1.967 mg/m³ (TRA Workers 3.0) | 0.133 |

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| | | |
|-------------------------------|--------------------------------------|-------|
| Inhalation, local, long term | 1.967 mg/m³ (TRA Workers 3.0) | 0.074 |
| Dermal, systemic, long term | 1.371 mg/kg bw/day (TRA Workers 3.0) | 0.326 |
| Combined, systemic, long term | | 0.459 |

4.3.7. Worker exposure: Treatment of articles by dipping and pouring; for up to 15 minutes (PROC 13)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|--------------------------------------|-------|
| Inhalation, systemic, long term | 0.983 mg/m³ (TRA Workers 3.0) | 0.066 |
| Inhalation, local, long term | 0.983 mg/m³ (TRA Workers 3.0) | 0.037 |
| Dermal, systemic, long term | 0.274 mg/kg bw/day (TRA Workers 3.0) | 0.065 |
| Combined, systemic, long term | | 0.132 |

4.3.8. Worker exposure: Manual activities involving hand contact (PROC 19)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|--------------------------------------|-------|
| Inhalation, systemic, long term | 4.917 mg/m³ (TRA Workers 3.0) | 0.332 |
| Inhalation, local, long term | 4.917 mg/m³ (TRA Workers 3.0) | 0.186 |
| Dermal, systemic, long term | 1.414 mg/kg bw/day (TRA Workers 3.0) | 0.337 |
| Combined, systemic, long term | | 0.669 |

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

5. ES 5: Consumer use; Washing and Cleaning Products (PC 35)

5.1. Title section

ES name: GES 5; Consumer end-use of washing and cleaning products

Product category: Washing and Cleaning Products (PC 35)

| Environment | | SPERC |
|--|--------|----------------------|
| 1: GES 5; Consumer end-use of washing and cleaning products | ERC 8a | |
| Consumer | | SCED |
| 2: LAUNDRY REGULAR (powder, liquid) for consumer use; LAUNDRY COMPACT (powder, liquid/gel, tablet) for consumer use; LAUNDRY ADDITIVES (powder bleach, liquid bleach, tablet) for consumer use | PC 35 | AISE_SCED_PC35_1_a_1 |
| 3: LAUNDRY AIDS (ironing aids-starch spray, ironing aids-other) for consumer use | PC 35 | AISE_SCED_PC35_1_a_1 |
| 4: FABRIC CONDITIONERS (liquid regular, liquid concentrate) for consumer use | PC 35 | AISE_SCED_PC35_2_a_1 |
| 5: SURFACE CLEANERS (liquid, powder, gel neat) for consumer use; CARPET CLEANERS (liquid) for consumer use; WIPES (bathroom, kitchen, floor) for consumer use; High Pressure washers/cleaners | PC 35 | AISE_SCED_PC35_3_a_1 |
| 6: TOILET CLEANERS (powder, liquid, gel, tablet) for consumer use | PC 35 | AISE_SCED_PC35_3_a_1 |
| 7: Automotive Care (liquid) | PC 35 | AISE_SCED_PC35_3_a_1 |
| 8: SURFACE CLEANERS (spray neat) for consumer use; OVEN CLEANERS (spray, trigger) for consumer use; CARPET CLEANERS (spray) for consumer use | PC 35 | AISE_SCED_PC35_3_b_1 |
| 9: Automotive Care (spray) | PC 35 | AISE_SCED_PC35_3_b_1 |
| 10: MACHINE DISHWASHING (powder, liquid, tablet) for consumer use | PC 35 | AISE_SCED_PC35_4_a_1 |
| 11: HAND DISHWASHING (liquid regular, liquid concentrate) for consumer use | PC 35 | AISE_SCED_PC35_5_a_1 |

5.2. Conditions of use affecting exposure

5.2.1. Control of environmental exposure: GES 5; Consumer end-use of washing and cleaning products (ERC 8a)

| Amount used, frequency and duration of use (or from service life) |
|---|
| Daily local widespread use amount |
| Percentage of EU tonnage used at regional scale |

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Other conditions affecting environmental exposure

Municipal sewage treatment plant is assumed.

5.2.2. Control of consumer exposure: LAUNDRY REGULAR (powder, liquid) for consumer use; LAUNDRY COMPACT (powder, liquid/gel, tablet) for consumer use; LAUNDRY ADDITIVES (powder bleach, liquid bleach, tablet) for consumer use (PC 35)

Product (article) characteristics

Covers concentrations up to 0.05 %

Exposure route; dermal; Yes

Inhalation exposure is considered to be not relevant.

Oral exposure is considered to be not relevant.

Amount used (or contained in articles), frequency and duration of use/exposure

Frequency of use over a year; Frequent

Covers use up to 1 events per day

Information and behavioral advice for consumers

Covers adult use.

Other conditions affecting consumers exposure

Assumes that potential dermal contact is limited to hands.

5.2.3. Control of consumer exposure: LAUNDRY AIDS (ironing aids-starch spray, ironing aids-other) for consumer use (PC 35)

Product (article) characteristics

Covers concentrations up to 0.025 %

Exposure route; dermal; Yes

Inhalation exposure is considered to be not relevant.

Oral exposure is considered to be not relevant.

Amount used (or contained in articles), frequency and duration of use/exposure

Frequency of use over a year; Frequent

Covers use up to 1 events per day

Information and behavioral advice for consumers

Covers adult use.

Other conditions affecting consumers exposure

Assumes that potential dermal contact is limited to hands.

5.2.4. Control of consumer exposure: FABRIC CONDITIONERS (liquid regular, liquid concentrate) for consumer use (PC 35)

Product (article) characteristics

Covers concentrations up to 0.1 %

Exposure route; dermal; Yes

Inhalation exposure is considered to be not relevant.

Oral exposure is considered to be not relevant.

Amount used (or contained in articles), frequency and duration of use/exposure

Frequency of use over a year; Frequent

Covers use up to 1 events per day

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Information and behavioral advice for consumers

Covers adult use.

Other conditions affecting consumers exposure

Assumes that potential dermal contact is limited to hands.

5.2.5. Control of consumer exposure: SURFACE CLEANERS (liquid, powder, gel neat) for consumer use; CARPET CLEANERS (liquid) for consumer use; WIPES (bathroom, kitchen, floor) for consumer use; High Pressure washers/cleaners (PC 35)

Product (article) characteristics

Covers concentrations up to 0.1 %

Exposure route; dermal; Yes

Exposure route; Inhalation; Yes

No spraying

Oral exposure is considered to be not relevant.

Amount used (or contained in articles), frequency and duration of use/exposure

For each use event, covers use amounts up to 110 g/event

Exposure duration = 0.3 h/event

Frequency of use over a year; Frequent

Covers use up to 1 events per day

Information and behavioral advice for consumers

Indoor use

Covers adult use.

Other conditions affecting consumers exposure

Assumes that potential dermal contact is limited to hands.

5.2.6. Control of consumer exposure: TOILET CLEANERS (powder, liquid, gel, tablet) for consumer use (PC 35)

Product (article) characteristics

Covers concentrations up to 0.3 %

Exposure route; dermal; Yes

Exposure route; Inhalation; Yes

No spraying

Oral exposure is considered to be not relevant.

Amount used (or contained in articles), frequency and duration of use/exposure

For each use event, covers use amounts up to 110 g/event

Exposure duration = 0.3 h/event

Frequency of use over a year; Frequent

Covers use up to 1 events per day

Information and behavioral advice for consumers

Indoor use

Covers adult use.

Other conditions affecting consumers exposure

Assumes that potential dermal contact is limited to hands.

5.2.7. Control of consumer exposure: Automotive Care (liquid) (PC 35)

Product (article) characteristics

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| |
|---|
| Covers concentrations up to 0.25 % |
| Exposure route; dermal; Yes |
| Exposure route; Inhalation; Yes |
| No spraying |
| Oral exposure is considered to be not relevant. |
| Amount used (or contained in articles), frequency and duration of use/exposure |
| For each use event, covers use amounts up to 110 g/event |
| Exposure duration = 0.3 h/event |
| Frequency of use over a year; Frequent |
| Covers use up to 1 events per day |
| Information and behavioral advice for consumers |
| Indoor use |
| Covers adult use. |
| Other conditions affecting consumers exposure |
| Assumes that potential dermal contact is limited to hands. |

5.2.8. Control of consumer exposure: SURFACE CLEANERS (spray neat) for consumer use; OVEN CLEANERS (spray, trigger) for consumer use; CARPET CLEANERS (spray) for consumer use (PC 35)

| |
|---|
| Product (article) characteristics |
| Covers concentrations up to 0.1 % |
| Exposure route; dermal; Yes |
| Exposure route; Inhalation; Yes |
| Spraying |
| Oral exposure is considered to be not relevant. |
| Amount used (or contained in articles), frequency and duration of use/exposure |
| For each use event, covers use amounts up to 30 g/event |
| Exposure duration = 0.2 h/event |
| Frequency of use over a year; Frequent |
| Covers use up to 1 events per day |
| Information and behavioral advice for consumers |
| Indoor use |
| Covers adult use. |
| Other conditions affecting consumers exposure |
| Assumes that potential dermal contact is limited to hands. |

5.2.9. Control of consumer exposure: Automotive Care (spray) (PC 35)

| |
|---|
| Product (article) characteristics |
| Covers concentrations up to 0.15 % |
| Exposure route; dermal; Yes |
| Exposure route; Inhalation; Yes |
| Spraying |
| Oral exposure is considered to be not relevant. |
| Amount used (or contained in articles), frequency and duration of use/exposure |
| For each use event, covers use amounts up to 30 g/event |
| Exposure duration = 0.2 h/event |
| Frequency of use over a year; Frequent |
| Covers use up to 1 events per day |

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Information and behavioral advice for consumers

Indoor use

Covers adult use.

Other conditions affecting consumers exposure

Assumes that potential dermal contact is limited to hands.

5.2.10. Control of consumer exposure: MACHINE DISHWASHING (powder, liquid, tablet) for consumer use (PC 35)

Product (article) characteristics

Covers concentrations up to 0.05 %

Exposure route; dermal; Yes

Inhalation exposure is considered to be not relevant.

Oral exposure is considered to be not relevant.

Amount used (or contained in articles), frequency and duration of use/exposure

Frequency of use over a year; Frequent

Covers use up to 1 events per day

Information and behavioral advice for consumers

Covers adult use.

Other conditions affecting consumers exposure

Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.

5.2.11. Control of consumer exposure: HAND DISHWASHING (liquid regular, liquid concentrate) for consumer use (PC 35)

Product (article) characteristics

Covers concentrations up to 0.05 %

Exposure route; dermal; Yes

Inhalation exposure is considered to be not relevant.

Oral exposure is considered to be not relevant.

Amount used (or contained in articles), frequency and duration of use/exposure

Frequency of use over a year; Frequent

Covers use up to 2 events per day

Information and behavioral advice for consumers

Covers adult use.

Other conditions affecting consumers exposure

Assumes that potential dermal contact is limited to hands.

5.3. Exposure estimation and reference to its source

5.3.1. Environmental release and exposure: GES 5; Consumer end-use of washing and cleaning products (ERC 8a)

| Release route | Release rate | Release estimation method |
|---------------|----------------|---------------------------|
| Water | 1.09E-3 kg/day | ERC |
| Air | 1.09E-3 kg/day | ERC |
| Soil | 0 kg/day | ERC |

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| Protection target | Exposure estimate | RCR |
|---|------------------------------------|--------|
| Fresh water | 4.18E-5 mg/L (EUSES 2.1.2) | 0.015 |
| Sediment (freshwater) | 0.013 mg/kg dw (EUSES 2.1.2) | 0.041 |
| Marine water | 4.13E-6 mg/L (EUSES 2.1.2) | 0.015 |
| Sediment (marine water) | 1.32E-3 mg/kg dw (EUSES 2.1.2) | 0.041 |
| Sewage Treatment Plant | 3.71E-4 mg/L (EUSES 2.1.2) | < 0.01 |
| Agricultural soil | 5.75E-3 mg/kg dw (EUSES 2.1.2) | < 0.01 |
| Predator's prey (freshwater) | 0.02 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Predator's prey (marine water) | 2.01E-3 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Top predator's prey (marine water) | 7.13E-4 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Predator's prey (terrestrial) | 0.111 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Man via environment - Inhalation (systemic effects) | 1.27E-7 mg/m³ (EUSES 2.1.2) | < 0.01 |
| Man via environment - Inhalation (local effects) | 1.27E-7 mg/m³ (EUSES 2.1.2) | < 0.01 |
| Man via environment - Oral | 8.33E-4 mg/kg bw/day (EUSES 2.1.2) | < 0.01 |
| Man via environment - combined routes | | < 0.01 |

5.3.2. Consumer exposure: LAUNDRY REGULAR (powder, liquid) for consumer use; LAUNDRY COMPACT (powder, liquid/gel, tablet) for consumer use; LAUNDRY ADDITIVES (powder bleach, liquid bleach, tablet) for consumer use (PC 35)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|--|--------|
| Inhalation, systemic, long term | 0 mg/m³ (TRA Consumers 3.1) | < 0.01 |
| Inhalation, local, long term | 0 mg/m³ (TRA Consumers 3.1) | < 0.01 |
| Dermal, systemic, long term | 0.071 mg/kg bw/day (TRA Consumers 3.1) | 0.048 |
| Oral, systemic, long term | 0 mg/kg bw/day (TRA Consumers 3.1) | < 0.01 |
| Combined, systemic, long term | | 0.048 |

5.3.3. Consumer exposure: LAUNDRY AIDS (ironing aids-starch spray, ironing aids-other) for consumer use (PC 35)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|--|--------|
| Inhalation, systemic, long term | 0 mg/m³ (TRA Consumers 3.1) | < 0.01 |
| Inhalation, local, long term | 0 mg/m³ (TRA Consumers 3.1) | < 0.01 |
| Dermal, systemic, long term | 0.036 mg/kg bw/day (TRA Consumers 3.1) | 0.024 |
| Oral, systemic, long term | 0 mg/kg bw/day (TRA Consumers 3.1) | < 0.01 |
| Combined, systemic, long term | | 0.024 |

5.3.4. Consumer exposure: FABRIC CONDITIONERS (liquid regular, liquid concentrate) for consumer use (PC 35)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|--|--------|
| Inhalation, systemic, long term | 0 mg/m³ (TRA Consumers 3.1) | < 0.01 |
| Inhalation, local, long term | 0 mg/m³ (TRA Consumers 3.1) | < 0.01 |
| Dermal, systemic, long term | 0.143 mg/kg bw/day (TRA Consumers 3.1) | 0.095 |
| Oral, systemic, long term | 0 mg/kg bw/day (TRA Consumers 3.1) | < 0.01 |
| Combined, systemic, long term | | 0.095 |

5.3.5. Consumer exposure: SURFACE CLEANERS (liquid, powder, gel neat) for consumer use; CARPET CLEANERS (liquid) for consumer use; WIPES (bathroom, kitchen, floor) for consumer use; High Pressure washers/cleaners (PC 35)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|--|--------|
| Inhalation, systemic, long term | 0.047 mg/m³ (TRA Consumers 3.1) | 0.018 |
| Inhalation, local, long term | 0.047 mg/m³ (TRA Consumers 3.1) | < 0.01 |
| Dermal, systemic, long term | 0.143 mg/kg bw/day (TRA Consumers 3.1) | 0.095 |
| Oral, systemic, long term | 0 mg/kg bw/day (TRA Consumers 3.1) | < 0.01 |
| Combined, systemic, long term | | 0.113 |

5.3.6. Consumer exposure: TOILET CLEANERS (powder, liquid, gel, tablet) for consumer use

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| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|--|--------|
| Inhalation, systemic, long term | 0.14 mg/m³ (TRA Consumers 3.1) | 0.054 |
| Inhalation, local, long term | 0.14 mg/m³ (TRA Consumers 3.1) | 0.021 |
| Dermal, systemic, long term | 0.429 mg/kg bw/day (TRA Consumers 3.1) | 0.286 |
| Oral, systemic, long term | 0 mg/kg bw/day (TRA Consumers 3.1) | < 0.01 |
| Combined, systemic, long term | | 0.339 |

5.3.7. Consumer exposure: Automotive Care (liquid) (PC 35)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|--|--------|
| Inhalation, systemic, long term | 0.117 mg/m³ (TRA Consumers 3.1) | 0.045 |
| Inhalation, local, long term | 0.117 mg/m³ (TRA Consumers 3.1) | 0.018 |
| Dermal, systemic, long term | 0.357 mg/kg bw/day (TRA Consumers 3.1) | 0.238 |
| Oral, systemic, long term | 0 mg/kg bw/day (TRA Consumers 3.1) | < 0.01 |
| Combined, systemic, long term | | 0.283 |

5.3.8. Consumer exposure: SURFACE CLEANERS (spray neat) for consumer use; OVEN CLEANERS (spray, trigger) for consumer use; CARPET CLEANERS (spray) for consumer use (PC 35)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|--|--------|
| Inhalation, systemic, long term | 1.339 mg/m³ (TRA Consumers 3.1) | 0.513 |
| Inhalation, local, long term | 1.339 mg/m³ (TRA Consumers 3.1) | 0.205 |
| Dermal, systemic, long term | 0.143 mg/kg bw/day (TRA Consumers 3.1) | 0.095 |
| Oral, systemic, long term | 0 mg/kg bw/day (TRA Consumers 3.1) | < 0.01 |
| Combined, systemic, long term | | 0.608 |

5.3.9. Consumer exposure: Automotive Care (spray) (PC 35)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|--|--------|
| Inhalation, systemic, long term | 2.009 mg/m³ (TRA Consumers 3.1) | 0.77 |
| Inhalation, local, long term | 2.009 mg/m³ (TRA Consumers 3.1) | 0.308 |
| Dermal, systemic, long term | 0.214 mg/kg bw/day (TRA Consumers 3.1) | 0.143 |
| Oral, systemic, long term | 0 mg/kg bw/day (TRA Consumers 3.1) | < 0.01 |
| Combined, systemic, long term | | 0.913 |

5.3.10. Consumer exposure: MACHINE DISHWASHING (powder, liquid, tablet) for consumer use (PC 35)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|--|--------|
| Inhalation, systemic, long term | 0 mg/m³ (TRA Consumers 3.1) | < 0.01 |
| Inhalation, local, long term | 0 mg/m³ (TRA Consumers 3.1) | < 0.01 |
| Dermal, systemic, long term | 0.036 mg/kg bw/day (TRA Consumers 3.1) | 0.024 |
| Oral, systemic, long term | 0 mg/kg bw/day (TRA Consumers 3.1) | < 0.01 |
| Combined, systemic, long term | | 0.024 |

5.3.11. Consumer exposure: HAND DISHWASHING (liquid regular, liquid concentrate) for consumer use (PC 35)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|--|--------|
| Inhalation, systemic, long term | 0 mg/m³ (TRA Consumers 3.1) | < 0.01 |
| Inhalation, local, long term | 0 mg/m³ (TRA Consumers 3.1) | < 0.01 |
| Dermal, systemic, long term | 0.143 mg/kg bw/day (TRA Consumers 3.1) | 0.095 |
| Oral, systemic, long term | 0 mg/kg bw/day (TRA Consumers 3.1) | < 0.01 |
| Combined, systemic, long term | | 0.095 |

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

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6. ES 6: Consumer use; Air care products (PC 3)

6.1. Title section

ES name: GES 6; Consumer end-use of air care products

Product category: Air care products (PC 3)

| | | |
|---|--------|---------------------|
| Environment | | SPERC |
| 1: GES 6; Consumer end-use of air care products | ERC 8a | |
| Consumer | | SCED |
| 2: AIR FRESHENERS NON AEROSOL (perfume in/on solid substrate (gel), diffusers (heated)) for consumer use) | PC 3 | AISE_SCED_PC3_7_a_1 |
| 3: AIR FRESHENERS NON AEROSOL (candles) for consumer use) | PC 3 | AISE_SCED_PC3_7_a_1 |
| 4: AIR FRESHENERS AEROSOL (aqueous, non aqueous, concentrated (mini-aerosol, Timed-release aerosols) for consumer use | PC 3 | AISE_SCED_PC3_7_b_1 |

6.2. Conditions of use affecting exposure

6.2.1. Control of environmental exposure: GES 6; Consumer end-use of air care products (ERC 8a)

| |
|--|
| Other conditions affecting environmental exposure |
| Municipal sewage treatment plant is assumed. |

6.2.2. Control of consumer exposure: AIR FRESHENERS NON AEROSOL (perfume in/on solid substrate (gel), diffusers (heated)) for consumer use) (PC 3)

| |
|---|
| Product (article) characteristics |
| Covers concentrations up to 5 % |
| Exposure route; dermal; Yes |
| Exposure route; Inhalation; Yes |
| No spraying |
| Oral exposure is considered to be not relevant. |
| Amount used (or contained in articles), frequency and duration of use/exposure |
| For each use event, covers use amounts up to 2.5 g/event |
| Exposure duration = 8 h/event |
| Frequency of use over a year; Frequent |
| Covers use up to 1 events per day |
| Information and behavioral advice for consumers |
| Indoor use |
| Covers adult use. |
| Other conditions affecting consumers exposure |
| Assumes that potential dermal contact is limited to two fingertips |

6.2.3. Control of consumer exposure: AIR FRESHENERS NON AEROSOL (candles) for consumer use) (PC 3)

| |
|--|
| Product (article) characteristics |
| Covers concentrations up to 0.5 % |
| Exposure route; dermal; Yes |
| Exposure route; Inhalation; Yes |
| No spraying |

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Oral exposure is considered to be not relevant.

Amount used (or contained in articles), frequency and duration of use/exposure

For each use event, covers use amounts up to 2.5 g/event

Exposure duration = 8 h/event

Frequency of use over a year; Frequent

Covers use up to 1 events per day

Information and behavioral advice for consumers

Indoor use

Covers adult use.

Other conditions affecting consumers exposure

Assumes that potential dermal contact is limited to two fingertips

6.2.4. Control of consumer exposure: AIR FRESHENERS AEROSOL (aqueous, non aqueous, concentrated (mini-aerosol, Timed-release aerosols) for consumer use (PC 3)

Product (article) characteristics

Covers concentrations up to 0.25 %

Assumes no dermal contact

Exposure route; Inhalation; Yes

Spraying

Oral exposure is considered to be not relevant.

Amount used (or contained in articles), frequency and duration of use/exposure

For each use event, covers use amounts up to 10 g/event

Exposure duration = 0.25 h/event

Frequency of use over a year; Frequent

Covers use up to 2 events per day

Information and behavioral advice for consumers

Indoor use

Covers adult use.

6.3. Exposure estimation and reference to its source

6.3.1. Environmental release and exposure: GES 6; Consumer end-use of air care products (ERC 8a)

| Release route | Release rate | Release estimation method |
|---------------|--------------|---------------------------|
| Water | 0 kg/day | ERC |
| Air | 0 kg/day | ERC |
| Soil | 0 kg/day | ERC |

| Protection target | Exposure estimate | RCR |
|--------------------------------|--------------------------------|--------|
| Fresh water | 4.87E-6 mg/L (EUSES 2.1.2) | < 0.01 |
| Sediment (freshwater) | 1.56E-3 mg/kg dw (EUSES 2.1.2) | < 0.01 |
| Marine water | 4.44E-7 mg/L (EUSES 2.1.2) | < 0.01 |
| Sediment (marine water) | 1.42E-4 mg/kg dw (EUSES 2.1.2) | < 0.01 |
| Sewage Treatment Plant | 0 mg/L (EUSES 2.1.2) | < 0.01 |
| Agricultural soil | 9.17E-6 mg/kg dw (EUSES 2.1.2) | < 0.01 |
| Predator's prey (freshwater) | 4.28E-3 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Predator's prey (marine water) | 3.9E-4 mg/kg ww (EUSES 2.1.2) | < 0.01 |

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|---|------------------------------------|--------|
| Top predator's prey (marine water) | 3.9E-4 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Predator's prey (terrestrial) | 0.013 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Man via environment - Inhalation (systemic effects) | 1.13E-7 mg/m³ (EUSES 2.1.2) | < 0.01 |
| Man via environment - Inhalation (local effects) | 1.13E-7 mg/m³ (EUSES 2.1.2) | < 0.01 |
| Man via environment - Oral | 1.02E-5 mg/kg bw/day (EUSES 2.1.2) | < 0.01 |
| Man via environment - combined routes | | < 0.01 |

6.3.2. Consumer exposure: AIR FRESHENERS NON AEROSOL (perfume in/on solid substrate (gel), diffusers (heated)) for consumer use) (PC 3)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|--|--------|
| Inhalation, systemic, long term | 0.011 mg/m³ (TRA Consumers 3.1) | < 0.01 |
| Inhalation, local, long term | 0.011 mg/m³ (TRA Consumers 3.1) | < 0.01 |
| Dermal, systemic, long term | 0.125 mg/kg bw/day (TRA Consumers 3.1) | 0.083 |
| Oral, systemic, long term | 0 mg/kg bw/day (TRA Consumers 3.1) | < 0.01 |
| Combined, systemic, long term | | 0.087 |

6.3.3. Consumer exposure: AIR FRESHENERS NON AEROSOL (candles) for consumer use) (PC 3)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|--|--------|
| Inhalation, systemic, long term | 1.08E-3 mg/m³ (TRA Consumers 3.1) | < 0.01 |
| Inhalation, local, long term | 1.08E-3 mg/m³ (TRA Consumers 3.1) | < 0.01 |
| Dermal, systemic, long term | 0.013 mg/kg bw/day (TRA Consumers 3.1) | < 0.01 |
| Oral, systemic, long term | 0 mg/kg bw/day (TRA Consumers 3.1) | < 0.01 |
| Combined, systemic, long term | | < 0.01 |

6.3.4. Consumer exposure: AIR FRESHENERS AEROSOL (aqueous, non aqueous, concentrated (mini-aerosol, Timed-release aerosols) for consumer use) (PC 3)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|------------------------------------|--------|
| Inhalation, systemic, long term | 2.174 mg/m³ (TRA Consumers 3.1) | 0.833 |
| Inhalation, local, long term | 2.174 mg/m³ (TRA Consumers 3.1) | 0.333 |
| Dermal, systemic, long term | 0 mg/kg bw/day (TRA Consumers 3.1) | < 0.01 |
| Oral, systemic, long term | 0 mg/kg bw/day (TRA Consumers 3.1) | < 0.01 |
| Combined, systemic, long term | | 0.833 |

6.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES**7. ES 7: Consumer use; Biocidal Products (PC 8)****7.1. Title section**

ES name: GES 7; Consumer end-use of biocides

Product category: Biocidal Products (PC 8)

| Environment | SPERC | |
|--|--------|------------------------------------|
| 1: GES 7; Consumer end-use of biocides | ERC 8a | |
| Consumer | SCED | |
| 2: INSECTICIDES (liquid electric) | PC 8 | PC8/CS1/AISE C19b_Tier 1.5 |
| 3: INSECTICIDES (spray neat) | PC 8 | PC8/CS1/AISE C19a_Refined Tier 1.5 |
| 4: REPELLENTS for consumer use | PC 8 | |

7.2. Conditions of use affecting exposure**7.2.1. Control of environmental exposure: GES 7; Consumer end-use of biocides (ERC 8a)**

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Other conditions affecting environmental exposure

Municipal sewage treatment plant is assumed.

7.2.2. Control of consumer exposure: INSECTICIDES (liquid electric) (PC 8)

Product (article) characteristics

Covers concentrations up to 1 %

Exposure route; dermal; Yes

Exposure route; Inhalation; Yes

No spraying

Oral exposure is considered to be not relevant.

Amount used (or contained in articles), frequency and duration of use/exposure

For each use event, covers use amounts up to 50 g/event

Exposure duration = 8 h/event

Frequency of use over a year; Frequent

Covers use up to 1 events per day

Information and behavioral advice for consumers

Indoor use

Covers adult use.

Other conditions affecting consumers exposure

Assumes that potential dermal contact is limited to fingertips.

7.2.3. Control of consumer exposure: INSECTICIDES (spray neat) (PC 8)

Product (article) characteristics

Covers concentrations up to 0.5 %

Exposure route; dermal; Yes

Exposure route; Inhalation; Yes

Spraying

Oral exposure is considered to be not relevant.

Amount used (or contained in articles), frequency and duration of use/exposure

For each use event, covers use amounts up to 10.1 g/event

Exposure duration = 0.25 h/event

Frequency of use over a year; Frequent

Covers use up to 1 events per day

Information and behavioral advice for consumers

Indoor use

Covers adult use.

Other conditions affecting consumers exposure

Assumes that potential dermal contact is limited to fingertips.

7.2.4. Control of consumer exposure: REPELLENTS for consumer use (PC 8)

Product (article) characteristics

Covers concentrations up to 1 %

Physical form of product; Liquids

Exposure route; dermal; Yes

Inhalation exposure is considered to be not relevant.

Exposure route; oral; Yes

Amount used (or contained in articles), frequency and duration of use/exposure

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| Covers use up to 2 events per day |
| Frequency of use over a year; Frequent |
| Assumes product amount in contact to skin |
| Information and behavioral advice for consumers |
| Covers adult use. |
| Other conditions affecting consumers exposure |
| Body parts potentially exposed; Whole body |
| Covers skin contact area up to 1.12E4 cm² |

7.3. Exposure estimation and reference to its source

7.3.1. Environmental release and exposure: GES 7; Consumer end-use of biocides (ERC 8a)

| Release route | Release rate | Release estimation method |
|---------------|--------------|---------------------------|
| Water | 0 kg/day | ERC |
| Air | 0 kg/day | ERC |
| Soil | 0 kg/day | ERC |

| Protection target | Exposure estimate | RCR |
|---|------------------------------------|--------|
| Fresh water | 4.87E-6 mg/L (EUSES 2.1.2) | < 0.01 |
| Sediment (freshwater) | 1.56E-3 mg/kg dw (EUSES 2.1.2) | < 0.01 |
| Marine water | 4.44E-7 mg/L (EUSES 2.1.2) | < 0.01 |
| Sediment (marine water) | 1.42E-4 mg/kg dw (EUSES 2.1.2) | < 0.01 |
| Sewage Treatment Plant | 0 mg/L (EUSES 2.1.2) | < 0.01 |
| Agricultural soil | 9.17E-6 mg/kg dw (EUSES 2.1.2) | < 0.01 |
| Predator's prey (freshwater) | 4.28E-3 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Predator's prey (marine water) | 3.9E-4 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Top predator's prey (marine water) | 3.9E-4 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Predator's prey (terrestrial) | 0.013 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Man via environment - Inhalation (systemic effects) | 1.13E-7 mg/m³ (EUSES 2.1.2) | < 0.01 |
| Man via environment - Inhalation (local effects) | 1.13E-7 mg/m³ (EUSES 2.1.2) | < 0.01 |
| Man via environment - Oral | 1.02E-5 mg/kg bw/day (EUSES 2.1.2) | < 0.01 |
| Man via environment - combined routes | | < 0.01 |

7.3.2. Consumer exposure: INSECTICIDES (liquid electric) (PC 8)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|---------------------------------------|--------|
| Inhalation, systemic, long term | 0.043 mg/m³ (TRA Consumers 3.1) | 0.017 |
| Inhalation, local, long term | 0.043 mg/m³ (TRA Consumers 3.1) | < 0.01 |
| Dermal, systemic, long term | 0.06 mg/kg bw/day (TRA Consumers 3.1) | 0.04 |
| Oral, systemic, long term | 0 mg/kg bw/day (TRA Consumers 3.1) | < 0.01 |
| Combined, systemic, long term | | 0.056 |

7.3.3. Consumer exposure: INSECTICIDES (spray neat) (PC 8)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|---------------------------------------|--------|
| Inhalation, systemic, long term | 2.196 mg/m³ (TRA Consumers 3.1) | 0.841 |
| Inhalation, local, long term | 2.196 mg/m³ (TRA Consumers 3.1) | 0.337 |
| Dermal, systemic, long term | 0.03 mg/kg bw/day (TRA Consumers 3.1) | 0.02 |
| Oral, systemic, long term | 0 mg/kg bw/day (TRA Consumers 3.1) | < 0.01 |
| Combined, systemic, long term | | 0.861 |

7.3.4. Consumer exposure: REPELLENTS for consumer use (PC 8)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|--------------------|--------|
| Inhalation, systemic, long term | 0 mg/m³ (ConsExpo) | < 0.01 |

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|-------------------------------|---------------------------------|--------|
| Inhalation, local, long term | 0 mg/m³ (ConsExpo) | < 0.01 |
| Dermal, systemic, long term | 0.148 mg/kg bw/day (ConsExpo) | 0.099 |
| Oral, systemic, long term | 5.92E-3 mg/kg bw/day (ConsExpo) | < 0.01 |
| Combined, systemic, long term | | 0.103 |

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

8. ES 8: Consumer use; Polishes and Wax Blends (PC 31)

8.1. Title section

ES name: GES 8; Consumer end-use of polishes and wax blends

Product category: Polishes and Wax Blends (PC 31)

| | | |
|---|--------|----------------------|
| Environment | SPERC | |
| 1: GES 8; Consumer end-use of polishes and wax blends | ERC 8a | |
| Consumer | SCED | |
| 2: Polishes, wax / cream (floor, furniture, shoes) | PC 31 | AISE_SCED_PC31_6_a_1 |
| 3: Polishes, spray (furniture, shoes, floor) | PC 31 | AISE_SCED_PC31_6_b_1 |

8.2. Conditions of use affecting exposure

8.2.1. Control of environmental exposure: GES 8; Consumer end-use of polishes and wax blends (ERC 8a)

| |
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| Other conditions affecting environmental exposure |
| Municipal sewage treatment plant is assumed. |

8.2.2. Control of consumer exposure: Polishes, wax / cream (floor, furniture, shoes) (PC 31)

| |
|--|
| Product (article) characteristics |
| Covers concentrations up to 0.1 % |
| Exposure route; dermal; Yes |
| Exposure route; Inhalation; Yes |
| No spraying |
| Oral exposure is considered to be not relevant. |
| Amount used (or contained in articles), frequency and duration of use/exposure |
| For each use event, covers use amounts up to 550 g/event |
| Exposure duration = 4 h/event |
| Covers infrequent uses, up to 2 weeks per year |
| Covers use up to 1 events per day |
| Information and behavioral advice for consumers |
| Indoor use |
| Covers adult use. |
| Other conditions affecting consumers exposure |
| Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. |

8.2.3. Control of consumer exposure: Polishes, spray (furniture, shoes, floor) (PC 31)

| |
|--|
| Product (article) characteristics |
| Covers concentrations up to 0.05 % |
| Exposure route; dermal; Yes |

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| |
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| Exposure route; Inhalation; Yes |
| Spraying |
| Oral exposure is considered to be not relevant. |
| Amount used (or contained in articles), frequency and duration of use/exposure |
| For each use event, covers use amounts up to 135 g/event |
| Exposure duration = 1 h/event |
| Covers infrequent uses, up to 2 weeks per year |
| Covers use up to 1 events per day |
| Information and behavioral advice for consumers |
| Indoor use |
| Covers adult use. |
| Other conditions affecting consumers exposure |
| Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. |

8.3. Exposure estimation and reference to its source

8.3.1. Environmental release and exposure: GES 8; Consumer end-use of polishes and wax blends (ERC 8a)

| Release route | Release rate | Release estimation method |
|---------------|--------------|---------------------------|
| Water | 0 kg/day | ERC |
| Air | 0 kg/day | ERC |
| Soil | 0 kg/day | ERC |

| Protection target | Exposure estimate | RCR |
|---|------------------------------------|--------|
| Fresh water | 4.87E-6 mg/L (EUSES 2.1.2) | < 0.01 |
| Sediment (freshwater) | 1.56E-3 mg/kg dw (EUSES 2.1.2) | < 0.01 |
| Marine water | 4.44E-7 mg/L (EUSES 2.1.2) | < 0.01 |
| Sediment (marine water) | 1.42E-4 mg/kg dw (EUSES 2.1.2) | < 0.01 |
| Sewage Treatment Plant | 0 mg/L (EUSES 2.1.2) | < 0.01 |
| Agricultural soil | 9.17E-6 mg/kg dw (EUSES 2.1.2) | < 0.01 |
| Predator's prey (freshwater) | 4.28E-3 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Predator's prey (marine water) | 3.9E-4 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Top predator's prey (marine water) | 3.9E-4 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Predator's prey (terrestrial) | 0.013 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Man via environment - Inhalation (systemic effects) | 1.13E-7 mg/m³ (EUSES 2.1.2) | < 0.01 |
| Man via environment - Inhalation (local effects) | 1.13E-7 mg/m³ (EUSES 2.1.2) | < 0.01 |
| Man via environment - Oral | 1.02E-5 mg/kg bw/day (EUSES 2.1.2) | < 0.01 |
| Man via environment - combined routes | | < 0.01 |

8.3.2. Consumer exposure: Polishes, wax / cream (floor, furniture, shoes) (PC 31)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|--|--------|
| Inhalation, systemic, long term | 0.081 mg/m³ (TRA Consumers 3.1) | 0.031 |
| Inhalation, local, long term | 0.081 mg/m³ (TRA Consumers 3.1) | 0.012 |
| Dermal, systemic, long term | 0.071 mg/kg bw/day (TRA Consumers 3.1) | 0.048 |
| Oral, systemic, long term | 0 mg/kg bw/day (TRA Consumers 3.1) | < 0.01 |
| Combined, systemic, long term | | 0.079 |

8.3.3. Consumer exposure: Polishes, spray (furniture, shoes, floor) (PC 31)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---------------------------------------|---------------------------------|-------|
| Inhalation, systemic, long term | 2.109 mg/m³ (TRA Consumers 3.1) | 0.808 |
| Inhalation, local, long term | 2.109 mg/m³ (TRA Consumers 3.1) | 0.324 |

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| Dermal, systemic, long term | 0.036 mg/kg bw/day (TRA Consumers 3.1) | 0.024 |
| Oral, systemic, long term | 0 mg/kg bw/day (TRA Consumers 3.1) | < 0.01 |
| Combined, systemic, long term | | 0.832 |

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

9. ES 9: Consumer use; Various products (PC 28, PC 39)

9.1. Title section

ES name: GES 9; Consumer (and Professional) end-use of cosmetics

Product category: Perfumes, Fragrances (PC 28), Cosmetics, personal care products (PC 39)

| Environment | |
|--|--------|
| 1: GES 9; Consumer (and Professional) end-use of cosmetics | ERC 8a |
| Consumer | |
| 2: Perfumes, fragrances | PC 28 |
| 3: Cosmetics, personal care products | PC 39 |

9.2. Conditions of use affecting exposure

9.2.1. Control of environmental exposure: GES 9; Consumer (and Professional) end-use of cosmetics (ERC 8a)

| Other conditions affecting environmental exposure |
|---|
| Municipal sewage treatment plant is assumed. |

9.2.2. Control of consumer exposure: Perfumes, fragrances (PC 28)

9.2.3. Control of consumer exposure: Cosmetics, personal care products (PC 39)

9.3. Exposure estimation and reference to its source

9.3.1. Environmental release and exposure: GES 9; Consumer (and Professional) end-use of cosmetics (ERC 8a)

| Release route | Release rate | Release estimation method |
|---------------|--------------|---------------------------|
| Water | 0 kg/day | ERC |
| Air | 0 kg/day | ERC |
| Soil | 0 kg/day | ERC |

| Protection target | Exposure estimate | RCR |
|---|--------------------------------|--------|
| Fresh water | 4.87E-6 mg/L (EUSES 2.1.2) | < 0.01 |
| Sediment (freshwater) | 1.56E-3 mg/kg dw (EUSES 2.1.2) | < 0.01 |
| Marine water | 4.44E-7 mg/L (EUSES 2.1.2) | < 0.01 |
| Sediment (marine water) | 1.42E-4 mg/kg dw (EUSES 2.1.2) | < 0.01 |
| Sewage Treatment Plant | 0 mg/L (EUSES 2.1.2) | < 0.01 |
| Agricultural soil | 9.17E-6 mg/kg dw (EUSES 2.1.2) | < 0.01 |
| Predator's prey (freshwater) | 4.28E-3 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Predator's prey (marine water) | 3.9E-4 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Top predator's prey (marine water) | 3.9E-4 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Predator's prey (terrestrial) | 0.013 mg/kg ww (EUSES 2.1.2) | < 0.01 |
| Man via environment - Inhalation (systemic effects) | 1.13E-7 mg/m³ (EUSES 2.1.2) | < 0.01 |
| Man via environment - Inhalation (local effects) | 1.13E-7 mg/m³ (EUSES 2.1.2) | < 0.01 |

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|---------------------------------------|------------------------------------|--------|
| Man via environment - Oral | 1.02E-5 mg/kg bw/day (EUSES 2.1.2) | < 0.01 |
| Man via environment - combined routes | | < 0.01 |

9.3.2. Consumer exposure: Perfumes, fragrances (PC 28)

9.3.3. Consumer exposure: Cosmetics, personal care products (PC 39)

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

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