Safety Data Sheet
according to UK REACH Regulations SI 2020/1577

Revision date: 1/18/2022
Supercedes: 9/29/2021

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

1.1. Product identifier:

Product trade name:	Kalama* Amyl Cinnamic Aldehyde
Company product number:	ACA
UK REACH registration number:	DUIN Submitted
Substance name:	Heptanal, 2-(phenylmethylene)-, (2E)
Substance identification number:	EC 800-696-3
Other means of identification:	Amyl cinnamal, alpha-Amyl cinnamaldehyde, a-Amyl cinnamaldehyde, 2-Benzylideneheptanal

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

Uses:	Fragrance ingredient. See Annex for covered uses. Odour agent.
Uses advised against:	None identified

1.3. Details of the supplier of the safety data sheet:

Manufacturer/Supplier:	Emerald Kalama Chemical, LLC 1296 NW Third Street Kalama, WA 98625 United States Telephone: +1-360-673-2550 1499 SE Tech Center Place, Suite 300 Vancouver, WA 98683 United States Telephone: +1-360-954-7100
UK Only Representative:	Penman Consulting Ltd Medina House, 2 Station Avenue Bridlington, East Yorkshire England Y016 4LZ Telephone: +44 1367 718 474 email: pcltd09@penmanconsulting.com
For further information about this SDS:	Email: product.compliance@emeraldmaterials.com

1.4. Emergency telephone number:

ChemTel (24 hours): 1-800-255-3924 (USA); +1-813-248-0585 (outside USA).

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture:

Product classification according to GB CLP as amended:

Skin sensitizer, category 1B, H317
Hazardous to the aquatic environment, Chronic, category 2, H411

See Section 2.2 for full text of H (Hazard) statements.

2.2. Label elements:

Product labeling according to GB CLP as amended:

Hazard pictogram(s):

Signal word:
Warning

Hazard statements:
H317 May cause an allergic skin reaction.
H411 Toxic to aquatic life with long lasting effects.

Precautionary statements:

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P273 Avoid release to the environment.
P280 Wear protective gloves.
P302+P352 IF ON SKIN: Wash with plenty of soap and water.
P333+P313 If skin irritation or rash occurs: Get medical advice/attention.
P362+P364 Take off contaminated clothing and wash it before reuse.
P391 Collect spillage.

Supplemental information: No Additional Information

Precautionary statements are listed according to the United Nations Globally Harmonized System of Classification and Labelling of Chemicals (GHS) - Annex III and GB CLP Guidance on Labelling and Packaging. Regulations in individual countries/regions may determine which statements are required on the product label. See product label for specifics.

2.3. Other hazards:

PBT/vPvB criteria: This product does not meet the PBT and vPvB classification criteria.
Other hazards: No Additional Information

See Section 11 for toxicological information.

SECTION 3: Composition/information on ingredients

3.1. Substance:

CAS-No.	Chemical Name	Weight%	Classification	H Statements
000122-40-7	Heptanal, 2-(phenylmethylene)-	98-100	Aquatic Chronic 2- Skin Sens. 1B	H317-411

CAS-No.	Chemical Name	Weight%	UK REACH Registration No.	EC/List Number
000122-40-7	Heptanal, 2-(phenylmethylene)-	98-100	DUIN Submitted	204-541-5 (800-696-3)

See Section 16 for full text of H (Hazard) statements.

Notes: HEPTANAL, 2-(PHENYLMETHYLENE)-: Alternative CAS# 78605-96-6 (EC 800-696-3).

Amounts specified are typical and do not represent a specification. Remaining components are proprietary, non-hazardous, and/or present at amounts below reportable limits.

SECTION 4: First aid measures

4.1. Description of first aid measures:

General: If irritation or other symptoms occur or persist from any route of exposure, remove the affected individual from the area: see a physician/get medical attention.

Eye contact: Any material that contacts the eye should be washed out immediately with water. Get medical attention if symptoms occur.

Skin contact: Immediately remove contaminated clothing and shoes. Wash the affected area with plenty of soap and water until no evidence of the chemical remains (at least 15-20 minutes). Launder clothing before reuse. If skin irritation occurs: Get medical advice/attention.

Inhalation: If affected, remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Call a POISON CENTER or doctor/physician if you feel unwell.

Ingestion: Do not induce vomiting. Never give anything by mouth to an unconscious person. Rinse out the mouth with water. Get medical attention immediately.

Protection of first aid responders: Wear proper personal protective clothing and equipment.

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

Irritation. Preexisting sensitization, skin and/or respiratory disorders or diseases may be aggravated. See section 11 for additional information.

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

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media:

Suitable: Use water spray, ABC dry chemical, foam or carbon dioxide. Water or foam may cause frothing. Use water to keep fire-exposed containers cool. Water spray may be used to flush spills away from exposures.

Unsuitable: Do not use direct water stream. May spread fire.

5.2. Special hazards arising from the substance or mixture:

Unusual fire/explosion hazards: Product is not considered a fire hazard, but will burn if ignited. Closed container may rupture (due to build up in pressure) when exposed to extreme heat.

Hazardous combustion products: Irritating or toxic substances may be emitted upon burning, combustion or decomposition. See section 10 (10.6 Hazardous decomposition products) for additional information.

5.3. Advice for firefighters:

Wear self-contained breathing apparatus (SCBA) equipped with a full facepiece and operated in a pressure-demand mode (or other positive pressure mode) and approved protective clothing. Personnel without suitable respiratory protection must leave the area to prevent significant exposure to hazardous gases from combustion, burning or decomposition. In an enclosed or poorly ventilated area, wear SCBA during cleanup immediately after a fire as well as during the attack phase of firefighting operations.

See section 9 for additional information.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures:

See Section 8 for recommendations on the use of personal protective equipment. If spilled in an enclosed area, ventilate. Eliminate ignition sources. Personal Protective Equipment must be worn.

6.2. Environmental precautions:

Do not flush liquid into public sewer, water systems or surface waters.

6.3. Methods and material for containment and cleaning up:

Contain by diking with sand, earth or other non-combustible material. Wear proper personal protective clothing and equipment. Absorb spill with an inert material. Place into labeled, closed container; store in safe location to await disposal. Change contaminated clothing and launder before reuse.

6.4. References to other sections:

See Section 8 for recommendations on the use of personal protection and Section 13 for waste disposal.

SECTION 7: Handling and storage

7.1. Precautions for safe handling:

As with any chemical product, use good laboratory/workplace procedures. Do not cut, puncture, or weld on or near the container. Wash thoroughly after handling this product. Always wash up before eating, smoking or using the facilities. Use under well-ventilated conditions. Avoid eye and skin contact. Avoid inhalation of aerosol, mist, spray, fume or vapor. Avoid drinking, tasting, swallowing or ingesting this product. Wash contaminated clothing before reuse. Provide eyewash fountains and safety showers in the work area.

7.2. Conditions for safe storage, including any incompatibilities:

Store cool and dry, under well-ventilated conditions. Store this material away from incompatible substances (see section 10). Do not store in open, unlabeled or mislabeled containers. Keep container closed when not in use. Do not reuse empty container without commercial cleaning or reconditioning. Empty container contains residual product which may exhibit hazards of product. Product can easily oxidize. It is recommended that opened containers be padded with nitrogen. Protect from light.

7.3. Specific end use(s):

Further information concerning special risk management measures: see annex of this safety data sheet (exposure scenarios).

SECTION 8: Exposure controls / personal protection

8.1. Control parameters:

Occupational exposure limits (OEL):

Chemical Name	ACGIH - TWA/Ceiling	ACGIH - STEL
Heptanal, 2-(phenylmethylene)-	N/E	N/E

Chemical Name	UK WEL
Heptanal, 2-(phenylmethylene)-	N/E

N/E=Not established (no exposure limits established for the listed substances for listed country/region/organization).

Derived No Effect Levels (DNELs):

Heptanal, 2-(phenylmethylene)-

Population	Route	Acute (local)	Acute (systemic)	Long Term (local)	Long Term (systemic)
Workers	Inhalation	N/E	N/E	N/E	3,71 mg/m3
Workers	Dermal	0,24 mg/cm2	N/E	0,24 mg/cm2	1,25 mg/kg bw/day
General population	Inhalation	N/E	N/E	N/E	0,922 mg/m3
General population	Dermal	0,12 mg/cm2	N/E	0,12 mg/cm2	0,625 mg/kg bw/day
General population	Oral	N/E	N/E	N/E	0,167 mg/kg bw/day

Population	Route	Acute (local)	Acute (systemic)	Long Term (local)	Long Term (systemic)
Human via the environment	Inhalation	N/E	N/E	N/E	0,922 mg/m3
Human via the environment	Oral	N/E	N/E	N/E	0,167 mg/kg bw/day

Predicted No Effect Concentration (PNECs):

Heptanal, 2-(phenylmethylene)-

Compartment	PNEC
Freshwater	0,0019 mg/L
Freshwater sediment	1,6 mg/kg dw
Marine water	0,00019 mg/L
Marine water sediment	0,16 mg/kg dw
Intermittent releases	0,019 mg/L
Soil	0,317 mg/kg dw
STP	100 mg/L
Oral	No potential to cause toxic effects

N/E=Not established; N/A=Not applicable (not required); bw=body weight; dw=dry weight; ww=wet weight.

8.2. Exposure controls:

Appropriate engineering controls: Always provide effective general and, when necessary, local exhaust ventilation to draw spray, aerosol, fume, mist and vapor away from workers to prevent routine inhalation. Ventilation must be adequate to maintain the ambient workplace atmosphere below the exposure limit(s) outlined in the SDS.

Individual protection measures, such as personal protective equipment:

Eye/face protection: Wear eye protection.

Hand protection: Avoid skin contact when mixing or handling the material by wearing impervious and chemical resistant gloves. In case of prolonged immersion or frequently repeated contact, gloves with breakthrough times greater than 480 minutes (protection class 6) are recommended. For brief contact or splash applications, gloves with breakthrough times of 30 minutes or greater are recommended (protection class 2 or greater). The protective gloves to be used must comply with the specifications of the standard EN 374. Suitability and durability of a glove is dependent on usage (e.g. frequency and duration of contact, other chemicals which may be handled, chemical resistance of glove material and dexterity). Always seek advice of the glove supplier as to the most suitable glove material.

Skin and body protection: Use good laboratory/workplace procedures including personal protective clothing: labcoat, safety glasses and protective gloves.

Respiratory protection: Respiratory protection is not needed with proper ventilation. Wear an approved respirator (e.g., an organic vapor respirator, a full face air purifying respirator for organic vapors, or a self-contained breathing apparatus) whenever exposure to aerosol, mist, spray, fume or vapor exceed the applicable exposure limit(s) of any chemical substance listed in this SDS.

Further information: Eyewash fountains and safety showers are recommended in the work area.

Environmental exposure controls: See Sections 6 and 12.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties:

Appearance:	Liquid. Pale yellow
Odour:	Characteristic
Odour threshold:	Not Available
pH:	Not Available
Melting point/Freezing point:	-1.6 °C (29 °F)
Initial boiling point and boiling range °C:	284-295 °C
Initial boiling point and boiling range °F:	543-563 °F
Flash point:	140 °C (284 °F) Closed Cup
Evaporation rate:	< 0.01
Flammability (solid, gas):	Not Applicable (liquid)
Upper/lower flammability or explosive limits:	LFL/LEL: Not Available UFL/UEL: Not Available
Vapour pressure:	0.29 Pa @ 20 °C (calculated)
Vapour density:	Not Available
Relative density:	0.96-0.97 (25 °C)
Solubility in water:	4.09 mg/L @ 25°C
Partition coefficient (n-octanol/water):	4.7 (24°C)
Autoignition temperature:	231 °C (448 °F)
Decomposition temperature:	Not Available
Viscosity:	13 mPa.s @ 20°C
Explosive properties:	Not explosive

Oxidising properties:	Not oxidizing
% Volatile By weight:	100%
VOC:	100%

9.2. Other information:

Amounts specified are typical and do not represent a specification.

SECTION 10: Stability and reactivity

10.1. Reactivity:

None known.

10.2. Chemical stability:

This product is stable. Readily undergoes oxidation by air.

10.3. Possibility of hazardous reactions:

Hazardous polymerization will not occur.

10.4. Conditions to avoid:

Avoid exposure to air, moisture, ignition sources and elevated temperatures.

10.5. Incompatible materials:

Avoid contact with strong oxidizing agents.

10.6. Hazardous decomposition products:

Carbon dioxide and carbon monoxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects:

Information on likely routes of exposure:

General: Caution must be exercised through the prudent use of protective equipment and handling procedures to minimize exposure.

Eyes: May cause eye irritation.

Skin: May cause allergic skin reaction. Repeated or prolonged skin contact may cause irritation.

Inhalation: High airborne concentrations of vapors resulting from heating, misting or spraying may cause irritation of the respiratory tract and mucous membranes.

Ingestion: May be harmful if swallowed. Ingestion may cause irritation.

Acute toxicity information: Not classified (based on available data, the classification criteria are not met).

Chemical Name	Inhalation LC50	Species	Oral LD50	Species	Dermal LD50	Species
Heptanal, 2-(phenylmethylene)-	>2,12 mg/L (similar materials, 4 hours, aerosol, no mortalities)	Rat/ adult	3730 mg/kg	Rat/ adult	>2000 mg/kg	Rabbit/ adult

Skin corrosion/irritation: Not classified (based on available data, the classification criteria are not met).

Chemical Name	Skin irritation	Species
Heptanal, 2-(phenylmethylene)-	Mild-moderate irritant	Rabbit/ adult

Serious eye damage/irritation: Not classified (based on available data, the classification criteria are not met).

Chemical Name	Eye irritation	Species
Heptanal, 2-(phenylmethylene)-	Slight irritant	Rabbit/ adult

Respiratory or skin sensitization: Skin sensitization - Category 1B.

Chemical Name	Skin sensitisation	Species
Heptanal, 2-(phenylmethylene)-	Sensitizer (EC3 7.6%)	Mouse/Local lymph node assay

Carcinogenicity: Not classified (no relevant information found).

Germ cell mutagenicity: Not classified (based on available data, the classification criteria are not met). HEPTANAL, 2-(PHENYLMETHYLENE)-: Ames mutagenicity test: negative. READ-ACROSS - alpha-Hexylcinnamaldehyde was not mutagenic in in-vivo and in-vitro studies.

Reproductive toxicity: Not classified. HEPTANAL, 2-(PHENYLMETHYLENE)-: Developmental toxicity, oral study, rabbit

(OECD 414): NOEL (no observed effect level), developmental toxicity = 60 mg/kg bw/day. READ-ACROSS - ALPHA-HEXYLCINNAMALDEHYDE: Reproductive toxicity, oral study in rats: NOAEL (no observed adverse effect level) = 100 mg/kg bw/day (OECD 421).

Specific target organ toxicity (STOT) - single exposure: Not classified (based on available data, the classification criteria are not met).

Specific target organ toxicity (STOT) - repeated exposure: Not classified (based on available data, the classification criteria are not met). HEPTANAL, 2-(PHENYLMETHYLENE)-: Repeated dose study, 14 weeks, oral, rat: NOAEL (no-observed-adverse-effect-level) 30 mg/kg/day. READ-ACROSS (α-Hexylcinnamaldehyde): Repeated dose study, 90-day dermal, rat: NOAEL 25 mg/kg bw/day (local effects); NOAEL 125 mg/kg bw/day (systemic effects).

Aspiration hazard: Not classified (no relevant information found).

Other toxicity information: No additional information available.

SECTION 12: Ecological information

12.1. Toxicity:

Chemical Name	Species	Acute	Acute	Chronic
Heptanal, 2-(phenylmethylene)-	Fish	LC50 3.0 mg/L (96 hours)	LC50 3.14 mg/L(96 hours) (calculated)	EC10 0.019 mg/L (35 days) (OECD 210)
Heptanal, 2-(phenylmethylene)-	Invertebrates	EC50 1.1 mg/L (48 hours)	N/E	EC10 23.14 µg/L (21 days) (OECD 211)
Heptanal, 2-(phenylmethylene)-	Algae	EC50 1.88 mg/L (72 hours) (OECD 201)	N/E	NOEC 0.154 mg/L(72 hours) (OECD 201)
Heptanal, 2-(phenylmethylene)-	Micro-organisms	EC50 >10000 mg/L (3 hours)		

12.2. Persistence and degradability:

Chemical Name	Biodegradation
Heptanal, 2-(phenylmethylene)-	Readily biodegradable (OECD 301F)

12.3. Bioaccumulative potential:

Chemical Name	Bioconcentration Factor (BCF)	Log Kow
Heptanal, 2-(phenylmethylene)-	586.2 L/kg (calculated)	4.7 (24°C)

12.4. Mobility in soil:

Chemical Name	Mobility in soil (Koc/Kow)
Heptanal, 2-(phenylmethylene)-	8365 (30°C)

12.5. Results of PBT and vPvB assessment:

This product does not meet the PBT and vPvB classification criteria.

12.6. Other adverse effects:

No additional information available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods:

Dispose of unused contents (incineration) in accordance with national and local regulations. Dispose of container in accordance with national and local regulations. Ensure the use of properly authorized waste management companies, where appropriate.

See Section 8 for recommendations on the use of personal protective equipment.

SECTION 14: Transport information

The information below is provided to assist in documentation. It may supplement the information on the package. The package in your possession may carry a different version of the label depending on the date of manufacture. Depending on inner packaging quantities and packaging instructions, it may be subject to specific regulatory exceptions.

14.1. UN number: UN3082

14.2. UN proper shipping name:

Environmentally hazardous substance, liquid, n.o.s. (2-Benzylideneheptanal)

14.3. Transport hazard class(es):

U.S. DOT hazard class: 9
Canada TDG hazard class: 9
Europe ADR/RID hazard class: 9
IMDG Code (ocean) hazard class: 9

ICAO/IATA (air) hazard class: 9

A "N/A" listing for the hazard class indicates the product is not regulated for transport by that regulation.

14.4. Packing group: III

14.5. Environmental hazards:

Marine pollutant: Marine Pollutant (IMDG code 2.9.3).

Hazardous substance (USA): Not Applicable

14.6. Special precautions for user:

Not Applicable

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

Not Applicable

Notes: For surface shipments within the United States: Not regulated.

SECTION 15: Regulatory information

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

STATUTORY INSTRUMENTS 2020 No. 1577, The REACH etc. (Amendment etc.) (EU Exit) Regulations 2020 [UK REACH]: Applicable components have been registered, are exempt or otherwise compliant. For UK REACH, CAS# 78605-96-6 (EC 800-696-3). UK REACH is only relevant to substances either manufactured or imported into the UK. Emerald Kalama Chemical has met its obligations under the UK REACH regulation. UK REACH information regarding this product is provided for informational purposes only. Each Legal Entity may have differing UK REACH obligations, depending on their place in the supply chain. Emerald's compliance with UK REACH does not imply automatic coverage for Downstream Users located in the UK. For material manufactured outside of the UK, the importer of record must understand and meet their specific obligations under the regulation.

UK Authorizations and/or restrictions on use: Not Applicable

Other UK information: No Additional Information

Chemical inventories:

Regulation	Status
Australian Inventory of Industrial Chemicals (AIIC):	Y
Canadian Domestic Substances List (DSL):	Y
Canadian Non-Domestic Substances List (NDSL):	N
China Inventory of Existing Chemical Substances (IECSC):	Y
European EC Inventory (EINECS, ELINCS, NLP):	Y
Japan Existing and New Chemical Substances (ENCS):	Y
Japan Industrial Safety and Health Law (ISHL):	Y
Korean Existing and Evaluated Chemical Substances (KECL):	Y
New Zealand Inventory of Chemicals (NZIoC):	Y
Philippines Inventory of Chemicals and Chemical Substances (PICCS):	Y
Taiwan Inventory of Existing Chemicals:	Y
U.S. Toxic Substances Control Act (TSCA) (Active):	Y

A "Y" listing indicates all intentionally added components are either listed or are otherwise compliant with the regulation. A "N" listing indicates that for one or more components: 1) there is no listing on the public inventory (or is not on the ACTIVE inventory for U.S. TSCA); 2) no information is available; or 3) the component has not been reviewed. A "Y" for New Zealand may mean that a qualified group standard may exist for the components in this product.

Europe REACH (EC) 1907/2006: Applicable components are registered, exempt or otherwise compliant. For Europe REACH, CAS# 78605-96-6 (EC 800-696-3). EU REACH is only relevant to substances either manufactured or imported into the EU. Emerald Kalama Chemical has met its obligations under the EU REACH regulation. EU REACH information regarding this product is provided for informational purposes only. Each Legal Entity may have differing EU REACH obligations, depending on their place in the supply chain. Emerald's compliance with EU REACH does not imply automatic coverage for Downstream Users located in the EU. For material manufactured outside of the EU, the importer of record must understand and meet their specific obligations under the regulation.

15.2. Chemical safety assessment:

A chemical safety assessment has been carried out for the substance or mixture consistent with the EU REACH regulation.

SECTION 16: Other information

Hazard (H) Statements in the Composition section (Section 3):

H317	May cause an allergic skin reaction.
H411	Toxic to aquatic life with long lasting effects.

Reason for revision: Changes in Section(s): 1

Evaulation method For classification Of mixtures: Not Applicable (substance)

Legend:
* : Trademark owned by Emerald Kalama Chemical, LLC.
ACGIH: American Conference of Governmental Industrial Hygienists
ATE: Acute toxicity estimate
N/A: Not Applicable
N/E: None Established
STEL: Short Term Exposure Limit
TWA: Time Weighted Average (exposure for 8-hour workday)
UK WEL: United Kingdom Workplace Exposure Limits

Users Responsibility/Disclaimer of Liability:
The information set forth herein is based on our current knowledge, and is intended to describe the product solely with respect to health, safety and the environment. As such, it must not be interpreted as a guarantee of any specific property of the product. As a result, the customer shall be solely responsible for deciding whether said information is suitable and beneficial.

Safety Data Sheet Preparer:
Product Compliance Department
Emerald Kalama Chemical, LLC
1499 SE Tech Center Place, Suite 300
Vancouver, WA 98683
United States

Annex

Exposure Scenarios

Substance information:

Name of substance: Heptanal, 2-(phenylmethylene)-, (2E).
EC# 800-696-3 / CAS# 78605-96-6
UK REACH Registration number: DUIN Submitted
EU REACH Registration number: 01-2119978288-18-0002

List of exposure scenarios:

ES1: Formulation - GES1 Formulation of fragrance compounds (compounding)
ES2: Formulation - GES2 Formulation of fragranced end-products (formulating)
ES3: Use at industrial sites - GES3 Industrial end-use of washing and cleaning products
ES4: Use by professional workers - GES4 Professional end-use of washing and cleaning products
ES5: Use by professional workers - GES5 Professional end-use of polishes and wax blends
ES6: Consumer use - GES6 Consumer end-use of washing and cleaning products
ES7: Consumer use - GES7 Consumer end-use of air care products
ES8: Consumer use - GES8 Consumer end-use of biocides
ES9: Consumer use - GES9 Consumer end-use of polishes and wax blends
ES10: Consumer use - GES10 Consumer end-use of cosmetics

General remarks:

Exposure scenarios are based on the following: Generic Exposure Scenarios (GES) and specific Exposure Scenarios (SpERCs) from the Industry Guidance Document REACH Exposure Scenarios for Fragrance Substances (version 2.1, 11 December 2012) developed by the International Fragrance Association (IFRA). AISE has developed Specific Consumers Exposure Determinants (SCEDs) to facilitate consumer exposure assessments for a range of consumer products including cleaning and air care products, in line with guidance developed by the DUCC/ CONCAWE task force under the CSR/ES Roadmap (2015).

The first tier environmental exposure assessments have at first instance been performed using EUSES v2.1.2 which is part of Chemical Safety Assessment and Reporting tool version 3.4 (CHESAR v3.4). Higher tier assessments have been performed if safe use was not demonstrated using first tier assessments. In these cases Specific Environmental Release Categories (SpERCs) have been used.

The worker dermal and inhalation exposure assessments for industrial and professional uses have been performed using ECETOC TRA Worker v3 model integrated in the Chemical Safety Assessment and Reporting tool (CHESAR v3.4) or the Advanced REACH tool (ART v1.5) (inhalation exposures). The RiskofDerm Tier 2 model was used to refine dermal exposure estimates, if necessary.

Consumer exposure assessments have been performed using ECETOC TRA v3.1 (R15) model (consumer module) in which:
- Fragrance concentration in fragranced end-product from the IFRA guidance (2012) is used at Tier 1.5 level consumer risk assessment;
- If necessary, further parameters are refined (Refined Tier 1.5) using the table of habits and practices for consumer products in western Europe from AISE (2009);
- If Tier 2 refinement is necessary, ConsExpo Web v1.0.6 is used.

Exposure scenario (1): Formulation - GES1 Formulation of fragrance compounds (compounding)

1. Exposure scenario (1)

Short title of the exposure scenario:
Formulation - GES1 Formulation of fragrance compounds (compounding)

List of use descriptors:
Process category (PROC): PROC1, PROC3, PROC5, PROC8a, PROC8b, PROC9, PROC15
Environmental release category (ERC): ERC2 (SpERC IFRA 2.1a.v1, 2.1b.v1)

List of names of contributing worker scenarios and corresponding PROCs:

PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition.
PROC5 Mixing or blending in batch processes. Covers mixing or blending of solid or liquid materials in the context of manufacturing or formulating sectors, as well as upon end use.
PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities. Transfer includes loading, filling, dumping, bagging and weighing.
PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities. Transfer includes loading, filling, dumping, bagging.
PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing). Filling lines specifically designed to both capture vapour and aerosol emissions and minimise spillage.
PROC15 Use as laboratory reagent. Use of substances at small scale laboratory (< 1 l or 1 kg present at workplace).

Name of contributing environmental scenario and corresponding ERCs:
ERC2 Formulation into mixture.
SpERC IFRA 2.1(a): Formulation of fragrance compounds at large/medium sites; SpERC IFRA 2.1(b): Formulation of fragrance compounds at small sites.

For further information on standardized use descriptors see the European Chemical Agency (ECHA) Guidance on information requirements and chemical safety assessment, Chapter R.12: Use descriptor system (http://guidance.echa.europa.eu/docs/guidance_document/information_requirements_r12_en.pdf). For further information on CEFIC (The European Chemical Industry Council) Specific Environmental Release Categories (SpERCs), see http://www.cefic.org/Industry-support/Implementing-reach/Libraries/.

2. Conditions of use affecting exposure

2.1 Control of workers exposure

General:
Generally accepted standards of occupational hygiene are maintained. Smoking, eating and drinking are prohibited at the workplace. Spills are cleaned immediately.

Product characteristics:
Concentration of substance in mixture/article:
- PROC1, PROC3, PROC5, PROC8b, PROC15: <=100%
- PROC8a, PROC9: <=25%
Physical form of the used product: Liquid.
Vapour pressure: 1,075 Pa at 40 °C

Amounts used:
Application rate: Unless otherwise stated, not specified.
- PROC5, PROC8a: use rate <=10 L/minute.
- PROC8b: flow transfer >1000 L/minute; use rate <=1 L/minute.
- PROC9: flow transfer 10-100 L/minutes; use rate <1 L/minute.
- PROC15: flow transfer < 0,1 L/minute.

Frequency and duration of use/exposure:
Duration of activity:
- PROC1, PROC8b, PROC9: <=1 hour/day.
- PROC3, PROC5, PROC8a: <=4 hours/day.
- PROC15: <=15 minutes/day.

Human factors not influenced by risk management:
Exposed skin surface:
- PROC1, PROC3, PROC15: 240 cm2 (one hand, face side only).
- PROC5, PROC8a, PROC8b, PROC9: 820 cm2 (hands).

Other given operational conditions affecting workers exposure:
Location: Indoor use.
Domain: Industrial use.
Process temperature: <= 40 °C.
Assessment tool used:
- PROC1: ECETOC TRA Worker v3 for inhalation and dermal exposure.
- PROC3, PROC15: ECETOC TRA Worker v3 for dermal exposures. Advanced REACH Tool (ART v1.5) for inhalation exposure.
- PROC5, PROC8a, PROC8b, PROC9: RiskofDerm Tier 2 for dermal exposures. Advanced REACH Tool (ART v1.5) for inhalation exposure.

Technical conditions and measures at process level (source) to prevent release:
Activity class - subclass (ART v1.5):
- PROC3: Activities with open liquid surfaces and open reservoirs - activities with agitated surfaces. Activities with agitated surfaces; open surface >3 m2. Containment: Medium level containment (99% reduction).
- PROC5: Activities with open liquid surfaces and open reservoirs - activities with agitated surfaces. Activities with agitated surfaces; open surface 1-3 m2. Containment: Low level containment (90% reduction).
- PROC8a: Handling of contaminated objects: Level of contamination: 10-90% of surface; Activities with treated/contaminated objects (surface >3 m2).
- PROC8b: Transfer of liquid products - falling liquids; splash loading. Containment: handling that reduces contact between product and adjacent air. Low level containment (90% reduction).
- PROC9: Transfer of liquid products - falling liquids; splash loading. Containment: Open process. Low level containment (90% reduction).
- PROC15: Transfer of liquid products - falling liquids; splash loading. Containment: Open process.

Technical conditions and measures to control dispersion from source towards the worker:
General ventilation:
- PROC1, PROC3, PROC9, PROC15: Basic general ventilation (1-3 air changes per hour): 0%.
- PROC5, PROC8a, PROC8b: Ventilation rate >=3 air changes per hour (ART 1.5).
Containment:
- PROC1: Closed system (minimal contact during routine operations).
- PROC3: Closed batch process with occasional controlled exposure.
- PROC8b, PROC9: Semi-closed process with occasional controlled exposure.

- PROC5, PROC8a, PROC15: No.
Local exhaust ventilation: Not required.
Local exhaust ventilation (for dermal): Not required.
Occupational Health and Safety Management System: Advanced.

Conditions and measures related to personal protection, hygiene and health evaluation:
Respiratory protection: Not required.
Dermal protection:
- PROC1, PROC15: No (Effectiveness Dermal: 0%).
- PROC3: Yes (chemically resistant gloves conforming to EN374) (Effectiveness Dermal: 80%).
- PROC8a, PROC8b, PROC9: Yes (chemically resistant gloves conforming to EN374 with basic employee training) (Effectiveness Dermal: 90%).
- PROC5: Yes (chemically resistant gloves conforming to EN374 with specific activity training) (Effectiveness Dermal: 95%).

Additional good practice advice:
Generally accepted standards of occupational hygiene are maintained.
Minimisation of manual phases/work tasks.
Minimisation of splashes and spills.
Avoidance of contact with contaminated tools and objects.
Regular cleaning of equipment and work area.
Training staff on good practice.
Management/supervision in place to check that RMMs in place are being used correctly and OCs followed.

2.2 Control of environmental exposure

General:
All risk management measures utilised must also comply with all relevant local regulations.

Product characteristics:
Physical state: liquid.

Amounts used:
Maximum daily use at a site: 0,08 tons/day (large/medium site); 0,0008 tons/day (small site).
Maximum annual use at a site: 20 tons/year (large/medium site); 2 tons/year (small site).
Fraction of the main local source: 1.
Percentage of tonnage used at regional scale: 25 % (large/medium site); 10 % (small site).

Frequency and duration of use:
Emission days: <=250 days/year.

Environmental factors not influenced by risk management:
Flow rate of receiving surface water: >=18,000 m3/day (default).

Other given operational conditions affecting environmental exposure:
Indoor use.
Industrial use.
Release fraction to air from process (initial release): 0,025; (final release): 0,025. Local release rate: 2 kg/day (large/medium site)(SpERC IFRA 2.1a.v1), 0,02 kg/day (small site)(SpERC IFRA 2.1b.v1).
Release fraction to wastewater from process: (initial release): 0,002; (final release): 0,002. Local release rate: 0,16 kg/day (large/medium site) (SpERC IFRA 2.1a.v1); (initial release): 0,005; (final release): 0,005. Local release rate: 0,004 kg/day (small site)(SpERC IFRA 2.1b.v1).
Release fraction to soil from process (final release): 0.0 (SpERC IFRA 2.1a.v1; 2.1b.v1).

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil:
Dry sludge application to agricultural soil: Yes (default).

Conditions and measures related to municipal sewage treatment plant:
Municipal Sewage Treatment Plant (STP): Yes (Efficiency=91.89%).
Size of municipal sewage system/treatment plant: >=2000 m3/day (standard town).

Conditions and measures related to external treatment of waste for disposal:
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)

Conditions and measures related to external recovery of waste:
External recovery and recycling of waste should comply with applicable local and/or national regulations.

Additional good practice advice:
All risk management measures utilised must also comply with all relevant local regulations.

3. Exposure estimation and reference to its source

Assessment method-Health: PROC1: ECETOC TRA Worker v3 for inhalation and dermal exposure. PROC3, PROC15: ECETOC TRA Worker v3 for dermal exposures. Advanced REACH Tool (ART v1.5) for inhalation exposure. PROC5, PROC8a, PROC8b, PROC9: RiskofDerm Tier 2 for dermal exposures. Advanced REACH Tool (ART v1.5) for inhalation exposure. Only highest figures are presented here.

Assessment method-Environment: CHESAR v3.4 - EUSES v2.1.2.

Health

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Worker, long-term, systemic, Dermal	0,34 mg/kg bw/day	0,272	PROC15
Worker, long-term, systemic, Inhalation	2,1 mg/m3	0,566	PROC3
Worker, long-term, systemic, Combined routes	N/A	0,676	PROC3
Worker, long-term, local, Dermal	0,1 mg/cm2	0,417	PROC5, PROC8b
Worker, short-term, local, Dermal	0,1 mg/cm2	0,417	PROC5, PROC8b

Environment

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Freshwater	0,000655 mg/L (a) / 0,0000299 mg/L (b)	0,345 (a) / 0,016 (b)	(a) large/medium site/ (b) small site

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Freshwater sediment	0,55 mg/kg dw (a) / 0,025 mg/ kg dw (b)	0,344 (a) / 0,016 (b)	(a) large/medium site/ (b) small site
Marine water	0,0000654 mg/L (a) / 0,0000029 mg/L (b)	0,344 (a) / 0,015 (b)	(a) large/medium site/ (b) small site
Marine water sediment	0,055 mg/kg dw (a) / 0,00243 mg/kg dw (b)	0,343 (a) / 0,015 (b)	(a) large/medium site/ (b) small site
Soil	0,198 mg/kg dw (a) / 0,00506 mg/kg dw (b)	0,624 (a) / 0016 (b)	(a) large/medium site/ (b) small site
STP	0,00649 mg/L (a) / 0,000162 mg/L (b)	<0,01 (a) / <0,01 (b)	(a) large/medium site/ (b) small site
Human via environment, Inhalation	0,000384 mg/m3 (a) / 0,0000417 mg/m3 (b)	<0,01 (a) / <0,01 (b)	(a) large/medium site/ (b) small site
Human via environment, Oral	0,00339 mg/kg bw/day (a) / 0,000253 mg/kg bw/day (b)	0,02 (a) / <0,01 (b)	(a) large/medium site/ (b) small site
Human via environment, Combined routes	N/A	0,021 (a) / <0,01 (b)	(a) large/medium site/ (b) small site

RCR=Risk characterization ratio (PEC/PNEC or Exposure estimate/DNEL); PEC=Predicted environmental concentration.

Notes: The exposure scenario categories consist of a number of activities. An individual worker may conduct one or several of these activities during one shift and a specific PROC or PROCs have been identified as worst-case activities for combined exposure. If parts of the worker's shift are spent conducting PROCs other than the worst-case PROC activities, the daily exposure of this worker will be lower than estimated for the worst case.

4. Guidance to the Downstream User to evaluate whether he works inside the boundaries set by the ES

Health:	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Concentration of substance in mixture/article: PROC1, PROC3, PROC5, PROC8b, PROC15: <=100%. PROC8a, PROC9: <=25%.
Environment:	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Exposure scenario (2): Formulation - GES2 Formulation of fragranced end-products (formulating)

1. Exposure scenario (2)

Short title of the exposure scenario:
Formulation - GES2 Formulation of fragranced end-products (formulating)

List of use descriptors:
Process category (PROC): PROC1, PROC3, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15
Environmental release category (ERC): ERC2 (SpERC AISE 2.1.l.v2 and Cosmetics Europe (CE) 2.1.d.v2, 2.1.j.v2).

List of names of contributing worker scenarios and corresponding PROCs:
PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition.
PROC5 Mixing or blending in batch processes. Covers mixing or blending of solid or liquid materials in the context of manufacturing or formulating sectors, as well as upon end use.
PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities. Transfer includes loading, filling, dumping, bagging and weighing.
PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities. Transfer includes loading, filling, dumping, bagging.
PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing). Filling lines specifically designed to both capture vapour and aerosol emissions and minimise spillage.
PROC14 Tabletting, compression, extrusion, pelletisation, granulation. This covers processing of mixtures and/or substances into a defined shape for further use.
PROC15 Use as laboratory reagent. Use of substances at small scale laboratory (< 1 l or 1 kg present at workplace).

Name of contributing environmental scenario and corresponding ERCs:
ERC2 Formulation into mixture.
SpERC:
- CS1: Formulation of liquid Detergents/Maintenance Products: high viscosity (small scale) (AISE 2.1.l.v2).
- CS2: Formulation of Fine Fragrances - Cleaning with Water (small scale) (Cosmetics Europe (CE) 2.1.d.v2).
- CS3: Formulation of Non-liquid Creams (small scale) (Cosmetics Europe (CE) 2.1.j.v2).

For further information on standardized use descriptors see the European Chemical Agency (ECHA) Guidance on information requirements and chemical safety assessment, Chapter R.12: Use descriptor system (http://guidance.echa.europa.eu/docs/guidance_document/information_requirements_r12_en.pdf). For further information on CEFIC (The European Chemical Industry Council) Specific Environmental Release Categories (SpERCs), see http://www.cefic.org/Industry-support/Implementing-reach/Libraries/.

2. Conditions of use affecting exposure

2.1 Control of workers exposure

General:
Generally accepted standards of occupational hygiene are maintained. Smoking, eating and drinking are prohibited at the workplace. Spills are cleaned immediately.

Product characteristics:
Concentration of substance in mixture/article:

- PROC1, PROC3, PROC5, PROC8b, PROC15: <=25%
- PROC8a, PROC9, PROC14: <=1%
Physical form of the used product: Liquid.
Vapour pressure: 1,075 Pa at 40 °C

Amounts used:
Application rate: Unless otherwise stated, not specified.
- PROC5: use rate <=10 L/minute.
- PROC8a, PROC9: use rate <=1 L/minute.
- PROC8b: flow transfer >1000 L/minute; use rate <=1 L/minute.
- PROC15: flow transfer < 0,1 L/minute.

Frequency and duration of use/exposure:
Duration of activity:
- PROC1, PROC8b, PROC9: <=1 hour/day.
- PROC3, PROC5, PROC8a: <=4 hours/day.
- PROC14: <=8 hours/day.
- PROC15: <=15 minutes/day.

Human factors not influenced by risk management:
Exposed skin surface:
- PROC1, PROC3, PROC15: 240 cm2 (one hand, face side only).
- PROC14: 480 cm2 (two hands, face side only).
- PROC5, PROC8a, PROC8b, PROC9: 820 cm2 (hands).

Other given operational conditions affecting workers exposure:
Location: Indoor use.
Domain: Industrial use.
Process temperature: <= 40 °C.
Assessment tool used:
- PROC1: ECETOC TRA Worker v3 for inhalation and dermal exposure.
- PROC9: ECETOC TRA Worker v3 for inhalation exposure. RiskofDerm Tier 2 for dermal exposures.
- PROC3, PROC14, PROC15: ECETOC TRA Worker v3 for dermal exposures. Advanced REACH Tool (ART v1.5) for inhalation exposure.
- PROC5, PROC8a, PROC8b: RiskofDerm Tier 2 for dermal exposures. Advanced REACH Tool (ART v1.5) for inhalation exposure.

Technical conditions and measures at process level (source) to prevent release:
Activity class - subclass (ART v1.5):
- PROC3: Activities with open liquid surfaces and open reservoirs - activities with agitated surfaces. Activities with agitated surfaces; open surface >3 m2. Containment: Medium level containment (99% reduction).
- PROC5: Activities with open liquid surfaces and open reservoirs - activities with agitated surfaces. Activities with agitated surfaces; open surface 1-3 m2. Containment: Low level containment (90% reduction).
- PROC8a: Handling of contaminated objects: Level of contamination: >90% of surface; Activities with treated/contaminated objects (surface >3 m2).
- PROC8b: Transfer of liquid products - falling liquids; splash loading. Containment: handling that reduces contact between product and adjacent air.
- PROC14: Compressing of powders, granules or pelletized material. Containment: open process.
- PROC15: Transfer of liquid products - falling liquids; splash loading. Containment: open process.

Technical conditions and measures to control dispersion from source towards the worker:
General ventilation:
- PROC1, PROC3, PROC5, PROC8a, PROC8b, PROC9, PROC15: Basic general ventilation (1-3 air changes per hour): 0%.
- PROC14: Good general ventilation (3-5 air changes per hour): 30%.
Containment:
- PROC1: Closed system (minimal contact during routine operations).
- PROC3: Closed batch process with occasional controlled exposure.
- PROC8b, PROC9: Semi-closed process with occasional controlled exposure.
- PROC5, PROC8a, PROC14, PROC15: No.
Local exhaust ventilation: Not required.
Local exhaust ventilation (for dermal): Not required.
Occupational Health and Safety Management System: Advanced.

Conditions and measures related to personal protection, hygiene and health evaluation:
Respiratory protection: Not required.
Dermal protection:
- PROC1, PROC3, PROC8a, PROC8b, PROC9, PROC14, PROC15: No (Effectiveness Dermal: 0%).
- PROC5: Yes (chemically resistant gloves conforming to EN374 with basic employee training) (Effectiveness Dermal: 90%).

Additional good practice advice:
Generally accepted standards of occupational hygiene are maintained.
Minimisation of manual phases/work tasks.
Minimisation of splashes and spills.
Avoidance of contact with contaminated tools and objects.
Regular cleaning of equipment and work area.
Training staff on good practice.
Management/supervision in place to check that RMMs in place are being used correctly and OCs followed.

2.2 Control of environmental exposure

General:
All risk management measures utilised must also comply with all relevant local regulations.

Product characteristics:
Physical state: liquid.

Amounts used:

Maximum daily use at a site:
- CS1, CS2: 0,02 tons/day.
- CS3: 0,004 tons/day.

Maximum annual use at a site:
- CS1, CS2: 5 tons/year.
- CS3: 1 ton/year.

Fraction of the main local source: 1.
Percentage of tonnage used at regional scale: 10 %.

Frequency and duration of use:
Emission days: <=250 days/year.

Environmental factors not influenced by risk management:
Flow rate of receiving surface water: >=18,000 m3/day (default).

Other given operational conditions affecting environmental exposure:
Indoor use.
Industrial use.
Release fraction to air from process (initial release): 0,0; (final release): 0,0. Local release rate: 0 kg/day.
Release fraction to wastewater from process:
- CS1: (initial release): 0,004; (final release): 0,004. Local release rate: 0,08 kg/day.
- CS2: (initial release): 0,00015; (final release): 0,00015. Local release rate: 0,003 kg/day.
- CS3: (initial release): 0,04; (final release): 0,04. Local release rate: 0,16 kg/day.

Release fraction to soil from process (final release): 0.
Type of process: Substance applied in aqueous process solution with negligible volatilization.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil:
Dry sludge application to agricultural soil: Yes (default).
Process efficiency: Process with efficient use of raw materials.
Equipment cleaning: Equipment cleaned with water, washing disposed of with wastewater.

Conditions and measures related to municipal sewage treatment plant:
Municipal Sewage Treatment Plant (STP): Yes (Efficiency=91.89%).
Size of municipal sewage system/treatment plant: >=2000 m3/day (standard town).

Conditions and measures related to external treatment of waste for disposal:
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)

Conditions and measures related to external recovery of waste:
External recovery and recycling of waste should comply with applicable local and/or national regulations.

Additional good practice advice:
All risk management measures utilised must also comply with all relevant local regulations.
General good practice: Trained staff, spill protection including waste reuse.

3. Exposure estimation and reference to its source

Assessment method-Health: PROC1: ECETOC TRA Worker v3 for inhalation and dermal exposure. PROC9: ECETOC TRA Worker v3 for inhalation exposure. RiskofDerm Tier 2 for dermal exposures. PROC3, PROC14, PROC15: ECETOC TRA Worker v3 for dermal exposures. Advanced REACH Tool (ART v1.5) for inhalation exposure. PROC5, PROC8a, PROC8b: RiskofDerm Tier 2 for dermal exposures. Advanced REACH Tool (ART v1.5) for inhalation exposure. Only highest figures are presented here.

Assessment method-Environment: CHESAR v3.4 - EUSES v2.1.2. Only highest figures are presented here.

Health

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Worker, long-term, systemic, Dermal	0,67 mg/kg bw/day	0,536	PROC8b
Worker, long-term, systemic, Inhalation	1,6 mg/m3	0,431	PROC5
Worker, long-term, systemic, Combined routes	N/A	0,628	PROC8b
Worker, long-term, local, Dermal	0,23 mg/cm2	0,958	PROC8b
Worker, short-term, local, Dermal	0,23 mg/cm2	0,958	PROC8b

Environment

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Freshwater	0,000655 mg/L	0,345	ERC2 (CS3)
Freshwater sediment	0,55 mg/kg dw	0,344	ERC2 (CS3)
Marine water	0,0000654 mg/L	0,344	ERC2 (CS3)
Marine water sediment	0,055 mg/kg dw	0,343	ERC2 (CS3)
Soil	0,197 mg/kg dw	0,622	ERC2 (CS3)
STP	0,00649 mg/L	<0,01	ERC2 (CS3)
Human via environment, Inhalation	0,00000414 mg/m3	<0,01	ERC2 (CS3)
Human via environment, Oral	0,0027 mg/kg bw/day	0,016	ERC2 (CS3)
Human via environment, Combined routes	N/A	0,016	ERC2 (CS3)

RCR=Risk characterization ratio (PEC/PNEC or Exposure estimate/DNEL); PEC=Predicted environmental concentration.

Notes: The exposure scenario categories consist of a number of activities. An individual worker may conduct one or several of these activities during one shift and a specific PROC or PROCs have been identified as worst-case activities for combined exposure. If parts of the worker's shift are spent conducting PROCs other than the worst-case PROC activities, the daily exposure of this worker will be lower than estimated for the worst case.

4. Guidance to the Downstream User to evaluate whether he works inside the boundaries set by the ES

Health:	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Concentration of substance in mixture/article: PROC1, PROC3, PROC5, PROC8b, PROC15: <=25%. PROC8a, PROC9, PROC14: <=1%.
Environment:	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Exposure scenario (3): Use at industrial sites - GES3 Industrial end-use of washing and cleaning products

1. Exposure scenario (3)

Short title of the exposure scenario:
Use at industrial sites - GES3 Industrial end-use of washing and cleaning products

List of use descriptors:
Product category (PC): PC35
Process category (PROC): PROC1, PROC2, PROC4, PROC7, PROC8b, PROC10, PROC13
Environmental release category (ERC): ERC4

List of names of contributing worker scenarios and corresponding PROCs:
CS2: PROC1 (AISE P801, P805).
CS3: PROC2 (AISE P101, P104, P107, P110).
CS4: PROC4 (AISE P810).
CS5: PROC4 (AISE P707, P708, P709, P712, P802).
CS6: PROC4 (AISE P904, P905).
CS7: PROC7 (AISE P710).
CS8: PROC7 (AISE P711, P714).
CS9: PROC7 (AISE P806).
CS10: PROC7 (AISE P803, P807, P809, P811).
CS11: PROC7 (AISE P906, P907).
CS12: PROC8b (AISE P101, P104, P107, P110, P801, P802, P803, P805).
CS13: PROC8b (AISE P904, P905, P906, P907).
CS14: PROC8b (AISE P707, P708, P709, P710, P712, P807, P811).
CS15: PROC8b (AISE P711, P713, P714).
CS16: PROC8b (AISE P809, P810).
CS17: PROC8b (AISE P806).
CS18: PROC10 (AISE P711, P713, P714).
CS19: PROC13 (AISE P804).
PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.
PROC4 Chemical production where opportunity for exposure arises.
PROC7 Industrial spraying. Air dispersive techniques i.e. dispersion into air (= atomization) by e.g. pressurized air, hydraulic pressure or centrifugation, applicable for liquids and powders.
PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities. Transfer includes loading, filling, dumping, bagging.
PROC10 Roller application or brushing. This includes application of paints, coatings, removers, adhesives or cleaning agents to surfaces with potential exposure arising from splashes.
PROC13 Treatment of articles by dipping and pouring.

Name of contributing environmental scenario and corresponding ERCs:
CS1: ERC4.
ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article).

Further explanations:
PC35 Washing and cleaning products.
Industrial use of Laundry products:
- AISE P101 Laundry detergent: Automatic process (PROC2, PROC8b).
- AISE P104 Conditioner (softener/starch): Automatic process (PROC2, PROC8b).
- AISE P107 Laundry aid (gasing): Automatic process (PROC2, PROC8b).
- AISE P110 Laundry aid (non-gasing): Automatic process (PROC2, PROC8b).

Industrial use of Vehicle cleaning Products:
- AISE P707 Train cleaner: Semi-Automatic process (PROC4, PROC8b).
- AISE P708 Aeroplane cleaner: Semi-Automatic process (PROC4, PROC8b).
- AISE P709 Car wash product: Semi-Automatic process (PROC4, PROC8b).
- AISE P710 Car wash product: Spray and rinse process (PROC7, PROC8b).
- AISE P711 Car wash product: Spray and wipe manual process (PROC7, PROC8b, PROC10)
- AISE P712 Dewaxing product: Semi-Automatic process (PROC4, PROC8b).
- AISE P713 Boat cleaning: Semi-Automatic process (PROC8b, PROC10).
- AISE P714 Boat cleaning: Spray and wipe manual process (PROC7, PROC8b, PROC10).

Industrial use of Food beverage and pharmacos products:
- AISE P801 Food process cleaner: Cleaning In Place process (PROC1, PROC8b).
- AISE P802 Food process cleaner: Semi closed cleaning process (PROC4, PROC8b).
- AISE P803 Chain maintenance product: Automatic spray process (PROC7, PROC8b).
- AISE P804 Chain maintenance product: Automatic drip and brush process (PROC13).
- AISE P805 Defoaming product: Automatic process (PROC1, PROC8b).
- AISE P806 Foam cleaner: Semi-Automatic with venting process (PROC7, PROC8b).
- AISE P807 Foam cleaner: Semi-Automatic without venting process (PROC7, PROC8b).

- AISE P809 Animal housing care: Semi-Automatic process (PROC7, PROC8b).
- AISE P810 Disinfection product: Semi-Automatic process (PROC4, PROC8b).
- AISE P811 Disinfection product: Fogging and gassing Semi-automatic process (PROC7, PROC8b).

Industrial use of Water treatment products:
- AISE P904 Preservation and sanitation agent: drink and pool water (PROC4, PROC8b).
- AISE P905 Preservation and sanitation agent: waste water (PROC4, PROC8b).

Industrial Use of Facade/surface Cleaning Products:
- AISE P906 Facade/surface cleaner: High pressure process (PROC7, PROC8b).
- AISE P907 Facade/surface cleaner: Medium pressure process (PROC7, PROC8b).

For further information on standardized use descriptors see the European Chemical Agency (ECHA) Guidance on information requirements and chemical safety assessment, Chapter R.12: Use descriptor system (http://guidance.echa.europa.eu/docs/guidance_document/information_requirements_r12_en.pdf).

2. Conditions of use affecting exposure

2.1 Control of workers exposure

General:
Generally accepted standards of occupational hygiene are maintained. Smoking, eating and drinking are prohibited at the workplace. Spills are cleaned immediately.

Product characteristics:
Concentration of substance in mixture/article: <=1%.
Physical form of the used product: Liquid.
Vapour pressure: 1,075 Pa at 40 °C

Amounts used:
Application rate (for inhalation exposure): Unless otherwise stated, not specified.
- PROC7 (CS9, CS10, CS11): moderate application rate (0.3-3 L/minute).
- PROC7 (CS7, CS8): high application rate (>3 L/minute).

Frequency and duration of use/exposure:
Duration of activity:
- PROC1, PROC2, PROC4 (CS5, CS6), PROC7 (CS9-CS11), PROC10: <=8 hours/day.
- PROC4 (CS4): <=4 hours/day.
- PROC7 (CS7, CS8), PROC8b (CS14-CS17), PROC13: <=1 hour/day.
- PROC8b (CS12, CS13): <=15 minutes/day.

Human factors not influenced by risk management:
Exposed skin surface:
- PROC1: 240 cm2 (one hand, face side only).
- PROC2, PROC4, PROC13: 480 cm2 (two hands, face side only).
- PROC8b, PROC10: 960 cm2 (two hands).
- PROC7: 1500 cm2 (two hands and upper wrists).

Other given operational conditions affecting workers exposure:
Location:
- PROC1, PROC2, PROC13: Indoor use.
- PROC4, PROC7, PROC8b: Indoor/outdoor use.
- PROC10: Outdoor use.

Domain: Industrial use.
Process temperature: <= 40 °C.
Assessment tool used:
- PROC1, PROC2, PROC4 (CS4), PROC8b, PROC13: ECETOC TRA Worker v3 for inhalation and dermal exposure.
- PROC4 (CS5, CS6), PROC7, PROC10: ECETOC TRA Worker v3 for dermal exposures. Advanced REACH Tool (ART v1.5) for inhalation exposure.

Technical conditions and measures at process level (source) to prevent release:
Activity class - subclass (ART v1.5):
- PROC4 (CS5), PROC10: Spreading of liquid products. Spreading of liquids at surfaces or work pieces: >3 m2/hour.
- PROC4 (CS6): Activities with open liquid surfaces and open reservoirs - activities with agitated surfaces. Activities with agitated surfaces; open surface >3 m2.
- PROC7 (CS7, CS10): Spray application of liquids - surface spraying of liquids. Spray technique: Spraying with high compressed air use. Spray direction: Only horizontal or downward spraying.
- PROC7 (CS8, CS9, CS11): Spray application of liquids - surface spraying of liquids. Spray technique: Spraying with high compressed air use. Spray direction: Spraying in any direction (including upwards).

Technical conditions and measures to control dispersion from source towards the worker:
General ventilation:
- PROC1, PROC2, PROC4 (CS4, CS5), PROC7 (CS7, CS10), PROC8b (CS12, CS14-CS17), PROC13: Basic general ventilation (1-3 air changes per hour): 0%.
- PROC7 (CS9): Ventilation rate >=3 air changes per hour (ART 1.5).
- PROC4 (CS6), PROC7 (CS8, CS11), PROC8b (CS13), PROC10: Outdoors (outdoor use).

Containment:
- PROC1: Closed system (minimal contact during routine operations).
- PROC2: Closed continuous process with occasional controlled exposure.
- PROC4, PROC8b: Semi-closed process with occasional controlled exposure.
- PROC7, PROC10, PROC13: No.

Local exhaust ventilation: Unless otherwise stated, Not required.
- PROC13: Yes (90% effectiveness).
- PROC7 (CS9), PROC8b (CS17): Yes (95% effectiveness).

Local exhaust ventilation (for dermal): Not required.
Occupational Health and Safety Management System: Advanced.

Conditions and measures related to personal protection, hygiene and health evaluation:
Respiratory protection:
- PROC1, PROC2, PROC4, PROC7 (CS7-CS9), PROC8b, PROC10, PROC13: Not required.
- PROC7 (CS10, CS11): Yes (Respirator with APF of 10) (Effectiveness Inhalation: 90%).
Dermal protection:
- PROC1, PROC2, PROC4 (CS6): No (Effectiveness Dermal: 0%).
- PROC8b (CS15): Yes (chemically resistant gloves conforming to EN374) (Effectiveness Dermal: 80%).
- PROC4 (CS4, CS5), PROC7 (CS9, CS10), PROC8b (CS12-CS14, CS16, CS17), PROC10, PROC13: Yes (chemically resistant gloves conforming to EN374 with basic employee training) (Effectiveness Dermal: 90%).
- PROC7 (CS7, CS8, CS11): Yes (chemically resistant gloves conforming to EN374 with specific activity training) (Effectiveness Dermal: 95%).

Additional good practice advice:
Generally accepted standards of occupational hygiene are maintained.
Minimisation of manual phases/work tasks.
Minimisation of splashes and spills.
Avoidance of contact with contaminated tools and objects.
Regular cleaning of equipment and work area.
Training staff on good practice.
Management/supervision in place to check that RMMs in place are being used correctly and OCs followed.

2.2 Control of environmental exposure

General:
All risk management measures utilised must also comply with all relevant local regulations.

Product characteristics:
Physical state: liquid.

Amounts used:
Maximum daily use at a site: 0,0000909 ton/day.
Maximum annual use at a site: 0,02 tons/year.
Fraction of the main local source: 0.1.
Percentage of tonnage used at regional scale: 10 %.

Frequency and duration of use:
Emission days: <=220 days/year.

Environmental factors not influenced by risk management:
Flow rate of receiving surface water: >=18,000 m3/day (default).

Other given operational conditions affecting environmental exposure:
Indoor use.
Industrial use.
Release fraction to air from process (initial release):1,00; (final release): 1,00. Local release rate: 0,091 kg/day.
Release fraction to wastewater from process (initial release): 1,00; (final release): 1,00. Local release rate: 0,091 kg/day.
Release fraction to soil from process (final release): 0,05.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil:
Dry sludge application to agricultural soil: Yes (default).

Conditions and measures related to municipal sewage treatment plant:
Municipal Sewage Treatment Plant (STP): Yes (Efficiency=91.89%).
Size of municipal sewage system/treatment plant: >=2000 m3/day (standard town).

Conditions and measures related to external treatment of waste for disposal:
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)

Conditions and measures related to external recovery of waste:
External recovery and recycling of waste should comply with applicable local and/or national regulations.

Additional good practice advice:
All risk management measures utilised must also comply with all relevant local regulations.

3. Exposure estimation and reference to its source

Assessment method-Health: PROC1, PROC2, PROC4 (CS4), PROC8b, PROC13: ECETOC TRA Worker v3 for inhalation and dermal exposure. PROC4 (CS5, CS6), PROC7, PROC10: ECETOC TRA Worker v3 for dermal exposures. Advanced REACH Tool (ART v1.5) for inhalation exposure. Only highest figures are presented here.

Assessment method-Environment: CHESAR v3.4 - EUSES v2.1.2.

Health

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Worker, long-term, systemic, Dermal	0,686 mg/kg bw/day	0,549	PROC4 (CS6)
Worker, long-term, systemic, Inhalation	2,529 mg/m3	0,682	PROC4 (CS4)
Worker, long-term, systemic, Combined routes	N/A	0,801	PROC7 (CS9)
Worker, long-term, local, Dermal	0,1 mg/cm2	0,417	PROC4 (CS6)
Worker, short-term, local, Dermal	0,1 mg/cm2	0,417	PROC4 (CS6)

Environment

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Freshwater	0,000378 mg/L	0,199	
Freshwater sediment	0,318 mg/kg dw	0,198	
Marine water	0,0000377 mg/L	0,198	
Marine water sediment	0,032 mg/kg dw	0,198	

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Soil	0,112 mg/kg dw	0,353	
STP	0,00369 mg/L	<0,01	
Human via environment, Inhalation	0,0000188 mg/m3	<0,01	
Human via environment, Oral	0,00154 mg/kg bw/day	<0,01	
Human via environment, Combined routes	N/A	<0,01	

RCR=Risk characterization ratio (PEC/PNEC or Exposure estimate/DNEL); PEC=Predicted environmental concentration.

Notes: The exposure scenario categories consist of a number of activities. An individual worker may conduct one or several of these activities during one shift and a specific PROC or PROCs have been identified as worst-case activities for combined exposure. If parts of the worker's shift are spent conducting PROCs other than the worst-case PROC activities, the daily exposure of this worker will be lower than estimated for the worst case.

4. Guidance to the Downstream User to evaluate whether he works inside the boundaries set by the ES

Health:	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Concentration of substance in mixture/article: <=1%.
Environment:	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Exposure scenario (4): Use by professional workers - GES4 Professional end-use of washing and cleaning products

1. Exposure scenario (4)

Short title of the exposure scenario:
Use by professional workers - GES4 Professional end-use of washing and cleaning products

List of use descriptors:
Process category (PROC): PROC1, PROC2, PROC4, PROC8a, PROC8b, PROC10, PROC11, PROC13
Environmental release category (ERC): ERC8a

List of names of contributing worker scenarios and corresponding PROCs:
CS2: PROC1 (AISE P102, P105, P108, P111, P203, P204, P1101).
CS3: PROC2 (AISE P202).
CS4: PROC4 (AISE P112).
CS5: PROC4 (AISE P701, P704).
CS6: PROC8a (AISE P102, P105, P108, P111, P112, P203, P204, P309, P1101, P1102).
CS7: PROC8a (AISE P901, P902).
CS8: PROC8a (AISE P201).
CS9: PROC8a (AISE P301, P302, P303, P304, P305, P306, P312, P401, P402, P403, P409, P410, P808, P1104).
CS10: PROC8a (AISE P103, P308, P314, P315, P404, P405, P701, P702, P704, P1103).
CS11: PROC8a (AISE P703, P705, P706).
CS12: PROC8b (AISE P202).
CS13: PROC10 (AISE P310).
CS14: PROC10 (AISE P103, P201, P317, P411).
CS15: PROC10 ((AISE P307).
CS16: PROC10 (AISE P113, P301, P302, P303, P304, P305, P403).
CS17: PROC10 (AISE P306, P312, P313, P314, P315, P316, P401, P402, P405, P409, P410, P808, P1103, P1104).
CS18: PROC10 (AISE P308, P311, P404).
CS19: PROC10 (AISE P703, P705, P706).
CS20: PROC10 (AISE P902).
CS21: PROC11 (AISE P113, P302, P304, P306, P313, P315, P402, P411, P702, P1104).
CS22: PROC11 (AISE P308, P311).
CS23: PROC11 (AISE P703, P706).
CS24: PROC11 (AISE P902).
CS25: PROC11 (AISE P901).
CS26: PROC13 (AISE P606, P607).
CS27: PROC13 (AISE P309, P1102).
PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.
PROC4 Chemical production where opportunity for exposure arises.
PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities. Transfer includes loading, filling, dumping, bagging and weighing.
PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities. Transfer includes loading, filling, dumping, bagging.
PROC10 Roller application or brushing. This includes application of paints, coatings, removers, adhesives or cleaning agents to surfaces with potential exposure arising from splashes.
PROC11 Non industrial spraying. Air dispersive techniques i.e. dispersion into air (= atomization) by e.g. pressurized air, hydraulic pressure or centrifugation, applicable for liquids and powders.
PROC13 Treatment of articles by dipping and pouring.

Name of contributing environmental scenario and corresponding ERCs:
CS1: ERC8a.
ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor).

Further explanations:
PC35 Washing and cleaning products.

Professional Use of Laundry products:
- AISE P102 Laundry detergent: Semi-automatic process (PROC1, PROC8a).
- AISE P103 Laundry detergent: Manual process (PROC8a, PROC10).
- AISE P105 Conditioner (softener/starch): Semi-automatic process (PROC1, PROC8a).
- AISE P108 Laundry aid (gasing): Semi-automatic process (PROC1, PROC8a).
- AISE P111 Laundry aid (non-gasing): Semi-automatic process (PROC1, PROC8a).
- AISE P112 Laundry aid (non-gasing): Manual process (PROC4, PROC8a).
- AISE P113 Prespotter/Stain remover: Manual process (PROC10, PROC11).

Professional Use of Dishwash products:
- AISE P201 Dishwash product: Manual process (PROC8a, PROC10).
- AISE P202 Rinse aid: Automatic process (PROC2, PROC8b).
- AISE P203 Dishwash product: Semi-automatic process (PROC1, PROC8a).
- AISE P204 Rinse aid: Semi-automatic process (PROC1, PROC8a).

Professional Use of General surface cleaning products:
- AISE P301 General purpose cleaner: Manual process (PROC8a, PROC10).
- AISE P302 General purpose cleaner: Spray and wipe manual process (PROC8a, PROC10, PROC11).
- AISE P303 Kitchen cleaner: Manual process (PROC8a, PROC10).
- AISE P304 Kitchen cleaner: Spray and wipe manual process (PROC8a, PROC10, PROC11).
- AISE P305 Sanitary cleaner: Manual process (PROC8a, PROC10).
- AISE P306 Sanitary cleaner: Spray and wipe manual process (PROC8a, PROC10, PROC11).
- AISE P307 Descaling agent: Manual process (PROC10).
- AISE P308 Descaling agent: Spray and rinse manual process (PROC8a, PROC10, PROC11).
- AISE P309 General surface cleaning: Dipping process: (PROC8a, PROC13).
- AISE P310 Oven/Grill cleaner: Manual process (PROC10).
- AISE P311 Oven/Grill Cleaner: Spray and wipe manual process (PROC10, PROC11).
- AISE P312 Glass cleaner: Manual process (PROC8a, PROC10).
- AISE P313 Glass cleaner: Spray and wipe manual process (PROC10, PROC11).
- AISE P314 Surface disinfectant: Manual process (PROC8a, PROC10).
- AISE P315 Surface disinfectant: Spray and rinse manual process (PROC8a, PROC10, PROC11).
- AISE P316 Metal cleaning agent: Manual process (PROC10).
- AISE P317 Surface cleaning: Wet wipes manual process (PROC10).

Professional Use of Floor care products:
- AISE P401 Floor cleaner: Semi-Automatic process (PROC8a, PROC10).
- AISE P402 Floor cleaner: Spray and wipe manual process (PROC8a, PROC10, PROC11).
- AISE P403 Floor cleaner: Manual process (PROC8a, PROC10).
- AISE P404 Floor stripper: Manual process (PROC8a, PROC10).
- AISE P405 Floor stripper: Semi-Automatic process (PROC8a, PROC10).
- AISE P409 Carpet cleaner: Manual process (PROC8a, PROC10).
- AISE P410 Carpet cleaner: Semi-Automatic process (PROC8a, PROC10).
- AISE P411 Carpet cleaner: Prespotter, brush manual process (PROC10, PROC11).

Professional Use of Maintenance Products :
- AISE P606 Drain unblocker: Manual process (PROC13).
- AISE P607 Drain cleaner: Manual process (PROC13).

Professional Use of Vehicle cleaning Products:
- AISE P701 Car wash product: Semi-Automatic process (PROC4, PROC8a).
- AISE P702 Car wash product: Spray manual process (PROC8a, PROC11).
- AISE P703 Car wash product: Spray and wipe manual process (PROC8a, PROC10, PROC11).
- AISE P704 Dewaxing product: Semi-Automatic process (PROC4, PROC8a).
- AISE P705 Boat cleaner: Manual process (PROC8a, PROC10).
- AISE P706 Boat cleaner: Spray and wipe manual process (PROC8a, PROC10, PROC11).

Professional Use of Food beverage and pharmacos products:
- AISE P808 Animal housing care: Manual process (PROC8a, PROC10).

Professional Use of Facade/surface Cleaning Products:
- AISE P901 Facade/surface cleaner: High pressure process (PROC8a, PROC11).
- AISE P902 Facade/surface cleaner: Medium pressure process (PROC8a, PROC10, PROC11).

Professional Use of Medical Devices:
- AISE P1101 Medical devices: Semi-automatic process (PROC1, PROC8a).
- AISE P1102 Medical devices: Dipping process (PROC8a, PROC13).
- AISE P1103 Medical devices: Manual process (PROC8a, PROC10).
- AISE P1104 Medical devices: Spray and wipe manual process (PROC8a, PROC10, PROC11).

For further information on standardized use descriptors see the European Chemical Agency (ECHA) Guidance on information requirements and chemical safety assessment, Chapter R.12: Use descriptor system (http://guidance.echa.europa.eu/docs/guidance_document/information_requirements_r12_en.pdf).

2. Conditions of use affecting exposure

2.1 Control of workers exposure

General:
Generally accepted standards of occupational hygiene are maintained. Smoking, eating and drinking are prohibited at the workplace. Spills are cleaned immediately.

Product characteristics:
Concentration of substance in mixture/article: <=1%.
Physical form of the used product: Liquid.
Vapour pressure: 1,075 Pa at 40 °C

Amounts used:
Application rate: Unless otherwise stated, not specified.

- PROC2: flow transfer 10-100 L/minute.
- PROC8a (CS6, CS10, CS11): flow transfer >1000 L/minute.
- PROC8a (CS8): use rate <=10 L/minute.
- PROC8a (CS9): flow transfer 1-10 L/minute; use rate <=1 L/minute.
- PROC10: application rate <=0,01 L/minute.
- PROC11 (CS21, CS22, CS24): moderate application rate (0,3-3 L/minute) (inhalation exposure); application rate 3 L/minute (dermal exposure).
- PROC11 (CS23): high application rate (>3 L/minute) (inhalation exposure); application rate 3 L/minute (dermal exposure).
- PROC11 (CS25): moderate application rate (0,3-3 L/minute) (inhalation exposure); application rate 0,1 L/minute (dermal exposure).

Frequency and duration of use/exposure:

Duration of activity:
- PROC1, PROC2, PROC4 (CS5), PROC10 (CS16-CS20), PROC11 (CS25): <=8 hours/day.
- PROC10 (CS14, CS15): <=4 hours/day.
- PROC8a (CS9-CS11), PROC10 (CS13), PROC11 (CS21-CS24), PROC13 (CS27): <=1 hour/day.
- PROC4 (CS4), PROC8a (CS6-CS8), PROC8b, PROC13 (CS26): <=15 minutes/day.

Human factors not influenced by risk management:

Exposed skin surface:
- PROC1: 240 cm2 (one hand, face side only).
- PROC2, PROC4, PROC13: 480 cm2 (two hands, face side only).
- PROC8a (CS8, CS9), PROC10: 820 cm2 (hands).
- PROC8a (CS6, CS7, CS10, CS11), PROC8b: 960 cm2 (two hands).
- PROC11: 1500 cm2 (two hands and upper wrists).

Other given operational conditions affecting workers exposure:

Location:
- PROC1, PROC2, PROC4, PROC8b, PROC13: Indoor use.
- PROC8a, PROC10, PROC11: Indoor/outdoor use.

Domain: Professional use.

Process temperature:
- Dermal exposure: <=40°C.
- Inhalation exposure: PROC1, PROC4, PROC8a, PROC8b, PROC10, PROC11, PROC13: <=40 °C; PROC2: <=70 °C.

Assessment tool used:
- PROC1, PROC4 (CS4), PROC8a (CS7), PROC8b, PROC13 (CS26): ECETOC TRA Worker v3 for inhalation and dermal exposure.
- PROC8a (CS8): ECETOC TRA Worker v3 for inhalation exposure. RiskofDerm Tier 2 for dermal exposures.
- PROC2, PROC4 (CS5), PROC8a (CS6, CS10, CS11), PROC13 (CS27): ECETOC TRA Worker v3 for dermal exposures. Advanced REACH Tool (ART v1.5) for inhalation exposure.
- PROC8a (CS9), PROC10, PROC11: RiskofDerm Tier 2 for dermal exposures. Advanced REACH Tool (ART v1.5) for inhalation exposure.

Technical conditions and measures at process level (source) to prevent release:

Activity class - subclass (ART v1.5):
- PROC2: Transfer of liquid products - falling liquids; splash loading. Containment: Open process. Low level containment (90% reduction).
- PROC4 (CS5): Spreading of liquid products. Spreading of liquids at surfaces or work pieces: >3 m2/hour.
- PROC8a (CS6, CS9-CS11): Transfer of liquid products; splash loading. Containment: Open process.
- PROC10: Spreading of liquid products. Spreading of liquids at surfaces or work pieces: >3 m2/hour. Tools with handles <30 cm in length.
- PROC11 (CS21, CS23, CS25): Spray application of liquids - surface spraying of liquids. Spray technique: Spraying with no or low compressed air use. Spray direction: Only horizontal or downward spraying.
- PROC11 (CS22, CS24): Spray application of liquids - surface spraying of liquids. Spray technique: Spraying with no or low compressed air use. Spray direction: Spraying in any direction (including upwards).
- PROC13 (CS27): Activities with open liquid surfaces and open reservoirs - activities with agitated surfaces. Activities with agitated surfaces; open surface >3 m2.

Technical conditions and measures to control dispersion from source towards the worker:

General ventilation:
- PROC8a (CS11), PROC10 (CS19), PROC11 (CS23): Outdoors (outdoor use).
- PROC1, PROC2, PROC4, PROC8a (CS6-CS10), PROC8b, PROC10 (CS13-CS18, CS20), PROC11 (CS21, CS22, CS24, CS25), PROC13: Basic general ventilation (1-3 air changes per hour): 0%.

Containment:
- PROC1: Closed system (minimal contact during routine operations).
- PROC2: Closed continuous process with occasional controlled exposure.
- PROC4, PROC8b: Semi-closed process with occasional controlled exposure.
- PROC8a, PROC10, PROC11, PROC13: No.

Local exhaust ventilation: Not required.

Local exhaust ventilation (for dermal): Not required.

Occupational Health and Safety Management System: Basic.

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

Respiratory protection: Unless otherwise stated, Not required.
- PROC8a (CS7), PROC10 (CS20), PROC11 (CS24, CS25): Yes (Respirator with APF of 10) (Effectiveness Inhalation: 90%).

Dermal protection:
- PROC1, PROC2, PROC8a (CS8, CS9), PROC10 (CS14, CS19), PROC11 (CS23): No (Effectiveness Dermal: 0%).
- PROC4, PROC8a (CS6, CS7, CS10, CS11), PROC8b, PROC10 (CS13, CS15-CS18, CS20), PROC11 (CS21,CS22, CS24, CS25), PROC13: Yes (chemically resistant gloves conforming to EN374) (Effectiveness Dermal: 80%).

Additional good practice advice:

Generally accepted standards of occupational hygiene are maintained.
Minimisation of manual phases/work tasks.
Minimisation of splashes and spills.
Avoidance of contact with contaminated tools and objects.
Regular cleaning of equipment and work area.
Training staff on good practice.

Management/supervision in place to check that RMMs in place are being used correctly and OCs followed.

2.2 Control of environmental exposure

General:
All risk management measures utilised must also comply with all relevant local regulations.

Product characteristics:
Physical state: liquid.

Amounts used:
Daily wide dispersive use: 0,0000055 tons/day.
Fraction of the main local source: 0,002.
Percentage of tonnage used at regional scale: 10 %.

Frequency and duration of use:
Emission days: <=365 days/year.
Wide dispersive use.

Environmental factors not influenced by risk management:
Flow rate of receiving surface water: >=18,000 m3/day (default).

Other given operational conditions affecting environmental exposure:
Indoor use.
Professional use.
Release fraction to air from process (initial release): 1,00; (final release): 1,00.
Release fraction to wastewater from process (initial release): 1,00; (final release): 1,00. Local release rate: 0,0055 kg/day.
Release fraction to soil from process (final release): 0.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil:
Dry sludge application to agricultural soil: Yes (default).

Conditions and measures related to municipal sewage treatment plant:
Municipal Sewage Treatment Plant (STP): Yes (Efficiency=91.89%).
Size of municipal sewage system/treatment plant: >=2000 m3/day (standard town).

Conditions and measures related to external treatment of waste for disposal:
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)

Conditions and measures related to external recovery of waste:
External recovery and recycling of waste should comply with applicable local and/or national regulations.

Additional good practice advice:
All risk management measures utilised must also comply with all relevant local regulations.

3. Exposure estimation and reference to its source

Assessment method-Health: PROC1, PROC4 (CS4), PROC8a (CS7), PROC8b, PROC13 (CS26): ECETOC TRA Worker v3 for inhalation and dermal exposure. PROC8a (CS8): ECETOC TRA Worker v3 for inhalation exposure. RiskofDerm Tier 2 for dermal exposures. PROC2, PROC4 (CS5), PROC8a (CS6, CS10, CS11), PROC13 (CS27): ECETOC TRA Worker v3 for dermal exposures. Advanced REACH Tool (ART v1.5) for inhalation exposure. PROC8a (CS9), PROC10, PROC11: RiskofDerm Tier 2 for dermal exposures. Advanced REACH Tool (ART v1.5) for inhalation exposure. Only highest figures are presented here.

Assessment method-Environment: CHESAR v3.4 - EUSES v2.1.2.

Health

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Worker, long-term, systemic, Dermal	0,289 mg/kg bw/day	0,231	PROC8a (CS9), PROC10 (CS19)
Worker, long-term, systemic, Inhalation	2,107 mg/m3	0,568	PROC8a (CS8)
Worker, long-term, systemic, Combined routes	N/A	0,668	PROC11 (CS25)
Worker, long-term, local, Dermal	0,2 mg/cm2	0,833	PROC10 (CS14, CS19)
Worker, short-term, local, Dermal	0,2 mg/cm2	0,833	PROC10 (CS14, CS19)

Environment

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Freshwater	0,0000359 mg/L	0,019	
Freshwater sediment	0,03 mg/kg dw	0,019	
Marine water	0,0000035 mg/L	0,018	
Marine water sediment	0,00294 mg/kg dw	0,018	
Soil	0,00683 mg/kg dw	0,022	
STP	0,000223 mg/L	<0,01	
Human via environment, Inhalation	0,00000361 mg/m3	<0,01	
Human via environment, Oral	0,00012 mg/kg bw/day	<0,01	
Human via environment, Combined routes	N/A	<0,01	

RCR=Risk characterization ratio (PEC/PNEC or Exposure estimate/DNEL); PEC=Predicted environmental concentration.

Notes: The exposure scenario categories consist of a number of activities. An individual worker may conduct one or several of these activities during one shift and a specific PROC or PROCs have been identified as worst-case activities for combined exposure. If parts of the worker's shift are spent conducting PROCs other than the worst-case PROC activities, the daily exposure of this worker will be lower than estimated for the worst case.

4. Guidance to the Downstream User to evaluate whether he works inside the boundaries set by the ES

Health:	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Concentration of substance in mixture/article: <=1%.
Environment:	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Exposure scenario (5): Use by professional workers - GES5 Professional end-use of polishes and wax blends

1. Exposure scenario (5)

Short title of the exposure scenario:
Use by professional workers - GES5 Professional end-use of polishes and wax blends

List of use descriptors:
Process category (PROC): PROC2, PROC8b, PROC10, PROC11
Environmental release category (ERC): ERC8a

List of names of contributing worker scenarios and corresponding PROCs:
CS2: PROC2 (AISE P605).
CS3: PROC8b (AISE P605).
CS4: PROC10 (AISE P601, P602 (wipe), P603, P604 (wipe), P609 (wipe)).
CS5: PROC10 (AISE P406, P407, P408 (wipe), P608).
CS6: PROC11 (AISE P602 (spray), P604 (spray), P609 (spray)).
CS7: PROC11 (AISE P408 (spray)).
PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.
PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities. Transfer includes loading, filling, dumping, bagging.
PROC10 Roller application or brushing. This includes application of paints, coatings, removers, adhesives or cleaning agents to surfaces with potential exposure arising from splashes.
PROC11 Non industrial spraying. Air dispersive techniques i.e. dispersion into air (= atomization) by e.g. pressurized air, hydraulic pressure or centrifugation, applicable for liquids and powders.

Name of contributing environmental scenario and corresponding ERCs:
CS1: ERC8a.
ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor).

Further explanations:
PC31 Polishes and wax blends.
Professional Use of Floor care products:
- AISE P406 Polish/impregnating agent: Manual process (PROC10).
- AISE P407 Polish/impregnating agent: Semi-Automatic process (PROC10).
- AISE P408 Polish/impregnating agent: Spray and wipe manual process (PROC10, PROC11).

Professional Use of Maintenance Products :
- AISE P601 Wooden Furniture care product: Manual process (PROC10).
- AISE P602 Wooden Furniture care product: Spray and wipe manual process (PROC10, PROC11).
- AISE P603 Leather care product: Manual process (PROC10).
- AISE P604 Leather care product: Spray and wipe manual process (PROC10, PROC11).
- AISE P605 Leather care product: Semi-automatic process (PROC2, PROC8b).
- AISE P608 Stainless steel care: Manual process (PROC10).
- AISE P609 Stainless steel care: Spray and wipe manual process (PROC10, PROC11).

For further information on standardized use descriptors see the European Chemical Agency (ECHA) Guidance on information requirements and chemical safety assessment, Chapter R.12: Use descriptor system (http://guidance.echa.europa.eu/docs/guidance_document/information_requirements_r12_en.pdf).

2. Conditions of use affecting exposure

2.1 Control of workers exposure

General:
Generally accepted standards of occupational hygiene are maintained. Smoking, eating and drinking are prohibited at the workplace. Spills are cleaned immediately.

Product characteristics:
Concentration of substance in mixture/article: <=1%.
Physical form of the used product: Liquid.
Vapour pressure: 1,075 Pa at 40 °C

Amounts used:
Application rate: Unless otherwise stated, not specified.
- PROC8b: flow transfer >1000 L/minute.
- PROC10: application rate <=0,01 L/minute.
- PROC11: moderate application rate (0,3-3 L/minute) (inhalation exposure); application rate 3 L/minute (dermal exposure).

Frequency and duration of use/exposure:
Duration of activity:
- PROC2, PROC10 (CS5): <=8 hours/day.
- PROC10 (CS4): <=4 hours/day.
- PROC8b, PROC11 (CS7): <=1 hour/day.
- PROC11 (CS6): <=15 minutes/day.

Human factors not influenced by risk management:
Exposed skin surface:
- PROC2: 480 cm2 (two hands, face side only).

- PROC10: 820 cm2 (hands).
- PROC8b: 960 cm2 (two hands).
- PROC11: 1500 cm2 (two hands and upper wrists).

Other given operational conditions affecting workers exposure:
Location: Indoor use.
Domain: Professional use.
Process temperature: <= 40 °C.
Assessment tool used:
- PROC2, PROC8b: ECETOC TRA Worker v3 for dermal exposures. Advanced REACH Tool (ART v1.5) for inhalation exposure.
- PROC10, PROC11: RiskofDerm Tier 2 for dermal exposures. Advanced REACH Tool (ART v1.5) for inhalation exposure.

Technical conditions and measures at process level (source) to prevent release:
Activity class - subclass (ART v1.5):
- PROC2: Activities with open liquid surfaces and open reservoirs - activities with agitated surfaces. Activities with agitated surfaces; open surface >3 m2.
- PROC8b: Transfer of liquid products - falling liquids; splash loading. Containment: Open process.
- PROC10: Spreading of liquid products. Spreading of liquids at surfaces or work pieces: >3 m2/hour. Tools with handles <30 cm in length.
- PROC11 (CS6): Spray application of liquids - surface spraying of liquids. Spray technique: Spraying with no or low compressed air use. Spray direction: Spraying in any direction (including upwards).
- PROC11 (CS7): Spray application of liquids - surface spraying of liquids. Spray technique: Spraying with no or low compressed air use. Spray direction: Only horizontal or downward spraying.

Technical conditions and measures to control dispersion from source towards the worker:
General ventilation:
- PROC8b, PROC10, PROC11: Basic general ventilation (1-3 air changes per hour): 0%.
- PROC2: Ventilation rate >=3 air changes per hour (ART 1.5).
Containment:
- PROC2: Closed continuous process with occasional controlled exposure.
- PROC8b: Semi-closed process with occasional controlled exposure.
- PROC10, PROC11: No.
Local exhaust ventilation: Not required.
Local exhaust ventilation (for dermal): Not required.
Occupational Health and Safety Management System: Basic.

Conditions and measures related to personal protection, hygiene and health evaluation:
Respiratory protection: Not required.
Dermal protection:
- PROC2, PROC10 (CS4), PROC11 (CS6): No (Effectiveness Dermal: 0%).
- PROC8b, PROC10 (CS5), PROC11 (CS7): Yes (chemically resistant gloves conforming to EN374) (Effectiveness Dermal: 80%).

Additional good practice advice:
Generally accepted standards of occupational hygiene are maintained.
Minimisation of manual phases/work tasks.
Minimisation of splashes and spills.
Avoidance of contact with contaminated tools and objects.
Regular cleaning of equipment and work area.
Training staff on good practice.
Management/supervision in place to check that RMMs in place are being used correctly and OCs followed.

2.2 Control of environmental exposure

General:
All risk management measures utilised must also comply with all relevant local regulations.

Product characteristics:
Physical state: liquid.

Amounts used:
Daily wide dispersive use: 0,0000055 tons/day.
Fraction of the main local source: 0,002.
Percentage of tonnage used at regional scale: 10 %.

Frequency and duration of use:
Emission days: <=365 days/year.
Wide dispersive use.

Environmental factors not influenced by risk management:
Flow rate of receiving surface water: >=18,000 m3/day (default).

Other given operational conditions affecting environmental exposure:
Indoor use.
Professional use.
Release fraction to air from process (initial release): 1,00; (final release): 1,00.
Release fraction to wastewater from process (initial release): 1,00; (final release): 1,00. Local release rate: 0,0055 kg/day.
Release fraction to soil from process (final release): 0.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil:
Dry sludge application to agricultural soil: Yes (default).

Conditions and measures related to municipal sewage treatment plant:
Municipal Sewage Treatment Plant (STP): Yes (Efficiency=91.89%).
Size of municipal sewage system/treatment plant: >=2000 m3/day (standard town).

Conditions and measures related to external treatment of waste for disposal:
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)

Conditions and measures related to external recovery of waste:
External recovery and recycling of waste should comply with applicable local and/or national regulations.

Additional good practice advice:
All risk management measures utilised must also comply with all relevant local regulations.

3. Exposure estimation and reference to its source

Assessment method-Health: PROC2, PROC8b: ECETOC TRA Worker v3 for dermal exposures. Advanced REACH Tool (ART v1.5) for inhalation exposure. PROC10, PROC11: RiskofDerm Tier 2 for dermal exposures. Advanced REACH Tool (ART v1.5) for inhalation exposure. Only highest figures are presented here.

Assessment method-Environment: CHESAR v3.4 - EUSES v2.1.2.

Health

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Worker, long-term, systemic, Dermal	0,29 mg/kg bw/day	0,232	PROC10 (CS4)
Worker, long-term, systemic, Inhalation	1,8 mg/m3	0,485	PROC11 (CS7)
Worker, long-term, systemic, Combined routes	N/A	0,553	PROC11 (CS7)
Worker, long-term, local, Dermal	0,2 mg/cm2	0,833	PROC10 (CS4)
Worker, short-term, local, Dermal	0,2 mg/cm2	0,833	PROC10 (CS4)

Environment

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Freshwater	0,0000359 mg/L	0,019	
Freshwater sediment	0,03 mg/kg dw	0,019	
Marine water	0,0000035 mg/L	0,018	
Marine water sediment	0,00294 mg/kg dw	0,018	
Soil	0,00683 mg/kg dw	0,022	
STP	0,000223 mg/L	<0,01	
Human via environment, Inhalation	0,00000361 mg/m3	<0,01	
Human via environment, Oral	0,00012 mg/kg bw/day	<0,01	
Human via environment, Combined routes	N/A	<0,01	

RCR=Risk characterization ratio (PEC/PNEC or Exposure estimate/DNEL); PEC=Predicted environmental concentration.

Notes: The exposure scenario categories consist of a number of activities. An individual worker may conduct one or several of these activities during one shift and a specific PROC or PROCs have been identified as worst-case activities for combined exposure. If parts of the worker's shift are spent conducting PROCs other than the worst-case PROC activities, the daily exposure of this worker will be lower than estimated for the worst case.

4. Guidance to the Downstream User to evaluate whether he works inside the boundaries set by the ES

Health: Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Concentration of substance in mixture/article: <=1%.

Environment: Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Exposure scenario (6): Consumer use - GES6 Consumer end-use of washing and cleaning products

1. Exposure scenario (6)

Short title of the exposure scenario:
Consumer use - GES6 Consumer end-use of washing and cleaning products

List of use descriptors:
Product category (PC): PC35
Environmental release category (ERC): ERC8a, ERC8d

Name of contributing environmental scenario and corresponding ERCs:
CS1: ERC8a, ERC8d.
ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor).
ERC8d Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor).

Further explanations:
PC35 Washing and cleaning products.
- CS2 Laundry and dishwashing products.
  - AISE C1 Laundry regular (powder, liquid).
  - AISE C2 Laundry compact (powder, liquid/gel, tablet).
  - AISE C3 Fabric conditioners (liquid regular, liquid concentrate).
  - AISE C4 Laundry additives (powder bleach, liquid bleach, tablet).
  - AISE C5 Hand dishwashing (liquid regular, liquid concentrate).
  - AISE C6 Machine dishwashing (powder, liquid, tablet).
  - AISE C12 Laundry aids (ironing aids-starch spray, ironing aids-other).

- CS3 Cleaners, liquids (all-purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners).
  - AISE C7 Surface cleaners (liquid, powder, gel neat).
  - AISE C8 Toilet cleaners (powder, liquid, gel, tablet).

- AISE C11 Carpet cleaners (liquid).
- AISE C15 Wipes (bathroom, kitchen, floor).
- AISE C21 High pressure washers/cleaners (liquid).
- AISE C22 Automotive care (liquid).

- CS4 Cleaners, trigger sprays (all-purpose cleaners, sanitary products, glass cleaners).
- AISE C7 Surface cleaners (spray neat).
- AISE C10 Oven cleaners (trigger spray).
- AISE C11 Carpet cleaners (spray).

- CS5 Cleaners, trigger sprays (all-purpose cleaners, sanitary products, glass cleaners).
- AISE C22 Automotive care (spray).

For further information on standardized use descriptors see the European Chemical Agency (ECHA) Guidance on information requirements and chemical safety assessment, Chapter R.12: Use descriptor system (http://guidance.echa.europa.eu/docs/guidance_document/information_requirements_r12_en.pdf).

2. Conditions of use affecting exposure

2.1 Control of consumer exposure

Product characteristics:
Concentration of substance in mixture/article:
- CS2, CS4: <=0,1%.
- CS3, CS5: <=0,25%.

Exposure via inhalation route: Yes.
Exposure via dermal route: Yes.
Oral contact foreseen: CS2, CS3, CS4: No. CS5: Yes.
Spray: CS2, CS3: No. CS4, CS5: Yes.

Amounts used:
Applied amounts for each use event:
- CS2: 50 g.
- CS3: 250 g.
- CS4: 35 g.
- CS5: Inhalation mass generation rate 1,6 g/sec for spray duration <= 0,23 minutes.

Frequency and duration of use/exposure:
Duration covers exposure up to:
- CS2, CS5: 1 hour/event.
- CS3: 0.33 hour/event.
- CS4: 4 hours/event.

Frequency - covers use frequency: up to 1 time/day; frequent use per year (235 times/year).

Human factors not influenced by risk management:
Body parts potentially exposed: Hands.
Inhalation factor = 1.
Dermal transfer factor=1.
Oral transfer factor = 1 (CS5).

Other given operational conditions affecting consumers exposure:
Location: Indoor use.
Body weight: 60 kg.
Inhalation exposure model: CS5 - Covers use in room size of >=4 m3.
Skin contact area: Unless otherwise stated, covers skin contact area up to 857.5 cm2.
- CS5: up to 2200 cm2.

Conditions and measures related to information and behavioral advice to consumers:
Assessment tool used: Fragrance concentration in fragranced end-product from the IFRA guidance (2012) is used at Tier 1.5 level consumer risk assessment.
- CS2, CS3, CS4: ECETOC TRA v3.1 (R15) model (consumer module.
- CS5: ECETOC TRA v3.1 (R15) model (consumer module) and ConsExpo web v1.0.6.

Conditions and measures related to personal protection and hygiene:
General ventilation: CS5: ventilation rate >= 2,5 air changes/ hour.

2.2 Control of environmental exposure

General:
All risk management measures utilised must also comply with all relevant local regulations.

Amounts used:
Daily wide dispersive use: 0,0000055 tons/day.
Fraction of the main local source: 0,002.
Percentage of tonnage used at regional scale: 10 %.

Frequency and duration of use:
Emission days: <=365 days/year.
Wide dispersive use.

Environmental factors not influenced by risk management:
Flow rate of receiving surface water: >=18,000 m3/day (default).

Other given operational conditions affecting environmental exposure:
Indoor/Outdoor use.
Consumer use.
Release fraction to air from process (initial release): 1,00; (final release): 1,00.
Release fraction to wastewater from process (initial release): 1,00; (final release): 1,00. Local release rate: 0,0055 kg/day.

Release fraction to soil from process (final release):
- ERC8a: 0,00.
- ERC8d: 0,20.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil:
Dry sludge application to agricultural soil: Yes (default).

Conditions and measures related to municipal sewage treatment plant:
Municipal Sewage Treatment Plant (STP): Yes (Efficiency=91.89%).
Size of municipal sewage system/treatment plant: >=2000 m3/day (standard town).

Conditions and measures related to external treatment of waste for disposal:
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)

Conditions and measures related to external recovery of waste:
External recovery and recycling of waste should comply with applicable local and/or national regulations.

Additional good practice advice:
All risk management measures utilised must also comply with all relevant local regulations.

3. Exposure estimation and reference to its source

Assessment method-Health: ECETOC TRA v3.1 (R15) model (consumer module) and CS5: ConsExpo web v1.0.6. Only highest figures are presented here.

Assessment method-Environment: CHESAR v3.4 - EUSES v2.1.2.

Health

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Consumer, long-term, systemic, Dermal	0,357 mg/kg bw/day	0,572	PC35 (CS3)
Consumer, long-term, systemic, Inhalation	0,515 mg/m3	0,558	PC35 (CS4)
Consumer, long-term, systemic, Oral	0,00000000126 mg/kg bw/day	<0,01	PC35 (CS5)
Consumer, long-term, systemic, Combined routes	N/A	0,855	PC35 (CS3)

Environment

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Freshwater	0,0000359 mg/L	0,019	ERC8d
Freshwater sediment	0,03 mg/kg dw	0,019	ERC8d
Marine water	0,0000035 mg/L	0,018	ERC8d
Marine water sediment	0,00294 mg/kg dw	0,018	ERC8d
Soil	0,00683 mg/kg dw	0,022	ERC8d
STP	0,000223 mg/L	<0,01	ERC8d
Human via environment, Inhalation	0,00000361 mg/m3	<0,01	ERC8d
Human via environment, Oral	0,00012 mg/kg bw/day	<0,01	ERC8d
Human via environment, Combined routes	N/A	<0,01	ERC8d

RCR=Risk characterization ratio (PEC/PNEC or Exposure estimate/DNEL); PEC=Predicted environmental concentration.

4. Guidance to the Downstream User to evaluate whether he works inside the boundaries set by the ES

Health:	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Environment:	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Exposure scenario (7): Consumer use - GES7 Consumer end-use of air care products

1. Exposure scenario (7)

Short title of the exposure scenario:
Consumer use - GES7 Consumer end-use of air care products

List of use descriptors:
Product category (PC): PC3
Environmental release category (ERC): ERC8a

Name of contributing environmental scenario and corresponding ERCs:
CS1: ERC8a.
ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor).

Further explanations:
PC3 Air care products:
- CS2: AISE C17 Air fresheners aerosol (aqueous, non-aqueous, concentrated (mini-aerosol, timed release aerosol)).
- CS3: AISE C18 Air fresheners non aerosol (perfume in/on solid substrate (gel), diffusers (heated), candles).

For further information on standardized use descriptors see the European Chemical Agency (ECHA) Guidance on information requirements and chemical safety assessment, Chapter R.12: Use descriptor system (http://guidance.echa.europa.eu/docs/guidance_document/information_requirements_r12_en.pdf).

2. Conditions of use affecting exposure

2.1 Control of consumer exposure

Product characteristics:

Concentration of substance in mixture/article:
- CS2: <=0,25%.
- CS3: <=0,9%.
Exposure via inhalation route: Yes.
Exposure via dermal route: CS2: Dermal exposure assumed to be negligible. CS3: Yes.
Oral contact foreseen: No.
Spray: CS2: Yes. CS3: No.

Amounts used:
Applied amounts for each use event:
- CS2: 1,8 g.
- CS3: 50 g.

Frequency and duration of use/exposure:
Duration covers exposure up to:
- CS2: 0,25 hours/event.
- CS3: 8 hours/event.
Frequency: covers use frequency:
- CS2: up to 4 times/day; frequent use per year.
- CS3: up to 1 time/day; frequent use per year.

Human factors not influenced by risk management:
Body parts potentially exposed:
- CS2: dermal exposure negligible compared to inhalation.
- CS3: fingertips.
Inhalation factor = 1.
Dermal transfer factor=1 (CS3).

Other given operational conditions affecting consumers exposure:
Location: Indoor use.
Body weight: 60 kg.

Conditions and measures related to information and behavioral advice to consumers:
Assessment tool used:
- CS2: ECETOC TRA v3.1 (R15) model (consumer module) in which: Fragrance concentration in fragranced end-product from the IFRA guidance (2012) is used at Tier 1.5 level consumer risk assessment; further parameters are refined if necessary (Refined Tier 1.5) using the table of habits and practices for consumer products in western Europe from AISE (2009).
- CS3: ECETOC TRA v3.1 (R15) model (consumer module) in which fragrance concentration in fragranced end-product from the IFRA guidance (2012) is used at Tier 1.5 level consumer risk assessment.

2.2 Control of environmental exposure

General:
All risk management measures utilised must also comply with all relevant local regulations.

Amounts used:
Daily wide dispersive use: 0,000011 tons/day.
Fraction of the main local source: 0,002.
Percentage of tonnage used at regional scale: 10 %.

Frequency and duration of use:
Emission days: <=365 days/year.
Wide dispersive use.

Environmental factors not influenced by risk management:
Flow rate of receiving surface water: >=18,000 m3/day (default).

Other given operational conditions affecting environmental exposure:
Indoor use.
Consumer use.
Release fraction to air from process (initial release): 1,00; (final release): 1,00.
Release fraction to wastewater from process (initial release): 1,00; (final release): 1,00. Local release rate: 0.011 kg/day.
Release fraction to soil from process (final release): 0,0.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil:
Dry sludge application to agricultural soil: Yes (default).

Conditions and measures related to municipal sewage treatment plant:
Municipal Sewage Treatment Plant (STP): Yes (Efficiency=91.89%).
Size of municipal sewage system/treatment plant: >=2000 m3/day (standard town).

Conditions and measures related to external treatment of waste for disposal:
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)

Conditions and measures related to external recovery of waste:
External recovery and recycling of waste should comply with applicable local and/or national regulations.

Additional good practice advice:
All risk management measures utilised must also comply with all relevant local regulations.

3. Exposure estimation and reference to its source

Assessment method-Health: ECETOC TRA v3.1 (R15) model (consumer module). Only highest figures are presented here.

Assessment method-Environment: CHESAR v3.4 - EUSES v2.1.2.

Health

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Consumer, long-term, systemic, Dermal	0,00536 mg/kg bw/day	<0,01	PC3 (CS3)

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Consumer, long-term, systemic, Inhalation	0,783 mg/m3	0,849	PC3 (CS2)
Consumer, long-term, systemic, Oral	0 mg/kg bw/day	<0,01	PC3
Consumer, long-term, systemic, Combined routes	N/A	0,849	PC3 (CS2)

Environment

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Freshwater	0,000058 mg/L	0,031	
Freshwater sediment	0,049 mg/kg dw	0,03	
Marine water	0,0000057 mg/L	0,03	
Marine water sediment	0,00479 mg/kg dw	0,03	
Soil	0,014 mg/kg dw	0,043	
STP	0,000446 mg/L	<0,01	
Human via environment, Inhalation	0,00000364 mg/m3	<0,01	
Human via environment, Oral	0,000219 mg/kg bw/day	<0,01	
Human via environment, Combined routes	N/A	<0,01	

No Information

4. Guidance to the Downstream User to evaluate whether he works inside the boundaries set by the ES

Health:	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Environment:	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Exposure scenario (8): Consumer use - GES8 Consumer end-use of biocides

1. Exposure scenario (8)

Short title of the exposure scenario:
Consumer use - GES8 Consumer end-use of biocides

List of use descriptors:
Product category (PC): PC8
Environmental release category (ERC): ERC8a, ERC8d

Name of contributing environmental scenario and corresponding ERCs:
CS1: ERC8a, ERC8d.
ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor).
ERC8d Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor).

Further explanations:
PC8 Biocidal products:
- CS2: AISE C19 Insecticides (spray neat).
- CS3: AISE C19 Insecticides (liquid electric).
- CS4: AISE C19 Repellents.

For further information on standardized use descriptors see the European Chemical Agency (ECHA) Guidance on information requirements and chemical safety assessment, Chapter R.12: Use descriptor system (http://guidance.echa.europa.eu/docs/guidance_document/information_requirements_r12_en.pdf).

2. Conditions of use affecting exposure

2.1 Control of consumer exposure

Product characteristics:
Concentration of substance in mixture/article:
- CS2, CS3: <=0,99%.
- CS4: <=0,4%.

Physical form of the used product: Liquid.
Exposure via inhalation route: CS2, CS3: Yes. CS4: Not relevant.
Exposure via dermal route: Yes.
Oral contact foreseen: CS2, CS3: No. CS4: Yes.
Spray: CS2: Yes. CS3, CS4: No.

Amounts used:
Applied amounts for each use event:
- CS2: Inhalation mass generation rate 1,1 g/sec for spray duration <= 0,33 minutes.
- CS3: 0,5 g.
- CS4: 6 g (dermal).

Frequency and duration of use/exposure:
Duration covers exposure up to:
- CS2: 0,25 hours/event.
- CS3: 8 hours/event.
- CS4: 3 hours/event (oral).

Frequency - covers use frequency: up to 1 time/day; frequent use per year.

Human factors not influenced by risk management:
Body parts potentially exposed:

- CS2: Hands.
- CS3: Fingertips.
- CS4: Whole body.

Inhalation factor = 1.
Dermal transfer factor=1.
Oral transfer factor = 1 (CS4).

Other given operational conditions affecting consumers exposure:
Location: Indoor/outdoor use.
Body weight: 60 kg.
Inhalation exposure model: CS2 - Covers use in room size of >=58 m3.

Conditions and measures related to information and behavioral advice to consumers:
Assessment tool used:
- CS2: ECETOC TRA v3.1 (R15) model (consumer module) and ConsExpo web v1.0.6. Fragrance concentration in fragranced end-product from the IFRA guidance (2012) is used at Tier 1.5 level consumer risk assessment.
- CS3: ECETOC TRA v3.1 (R15) model (consumer module.
- CS4: ECETOC TRA v3.1 (R15) model (consumer module) and ConsExpo web v1.0.6.

Conditions and measures related to personal protection and hygiene:
General ventilation: CS2: ventilation rate >= 0,5 air changes/ hour.

2.2 Control of environmental exposure

General:
All risk management measures utilised must also comply with all relevant local regulations.

Product characteristics:
Physical state: liquid.

Amounts used:
Daily wide dispersive use: 0,0000055 tons/day.
Fraction of the main local source: 0,002.
Percentage of tonnage used at regional scale: 10 %.

Frequency and duration of use:
Emission days: <=365 days/year.
Wide dispersive use.

Environmental factors not influenced by risk management:
Flow rate of receiving surface water: >=18,000 m3/day (default).

Other given operational conditions affecting environmental exposure:
Indoor/Outdoor use.
Consumer use.
Release fraction to air from process (initial release): 1,00; (final release): 1,00.
Release fraction to wastewater from process (initial release): 1,00; (final release): 1,00. Local release rate: 0,0055 kg/day.
Release fraction to soil from process (final release):
- ERC8a: 0,00.
- ERC8d: 0,20.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil:
Dry sludge application to agricultural soil: Yes (default).

Conditions and measures related to municipal sewage treatment plant:
Municipal Sewage Treatment Plant (STP): Yes (Efficiency=91.89%).
Size of municipal sewage system/treatment plant: >=2000 m3/day (standard town).

Conditions and measures related to external treatment of waste for disposal:
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)

Conditions and measures related to external recovery of waste:
External recovery and recycling of waste should comply with applicable local and/or national regulations.

Additional good practice advice:
All risk management measures utilised must also comply with all relevant local regulations.

3. Exposure estimation and reference to its source

Assessment method-Health: ECETOC TRA v3.1 (R15) model (consumer module) and CS2, CS4: ConsExpo web v1.0.6. Only highest figures are presented here.

Assessment method-Environment: CHESAR v3.4 - EUSES v2.1.2.

Health

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Consumer, long-term, systemic, Dermal	0,4 mg/kg bw/day	0,64	PC8 (CS4)
Consumer, long-term, systemic, Inhalation	0,18 mg/m3	0,195	PC8 (CS2)
Consumer, long-term, systemic, Oral	0,016 mg/kg bw/day	0,096	PC8 (CS4)
Consumer, long-term, systemic, Combined routes	N/A	0,736	PC8 (CS4)

Environment

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Freshwater	0,0000359 mg/L	0,019	ERC8d
Freshwater sediment	0,03 mg/kg dw	0,019	ERC8d
Marine water	0,0000035 mg/L	0,018	ERC8d
Marine water sediment	0,00294 mg/kg dw	0,018	ERC8d

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Soil	0,00683 mg/kg dw	0,022	ERC8d
STP	0,000223 mg/L	<0,01	ERC8d
Human via environment, Inhalation	0,00000361 mg/m3	<0,01	ERC8d
Human via environment, Oral	0,00012 mg/kg bw/day	<0,01	ERC8d
Human via environment, Combined routes	N/A	<0,01	ERC8d

RCR=Risk characterization ratio (PEC/PNEC or Exposure estimate/DNEL); PEC=Predicted environmental concentration.

4. Guidance to the Downstream User to evaluate whether he works inside the boundaries set by the ES

Health: Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Environment: Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Exposure scenario (9): Consumer use - GES9 Consumer end-use of polishes and wax blends

1. Exposure scenario (9)

Short title of the exposure scenario:
Consumer use - GES9 Consumer end-use of polishes and wax blends

List of use descriptors:
Product category (PC): PC31
Environmental release category (ERC): ERC8a

Name of contributing environmental scenario and corresponding ERCs:
CS1: ERC8a.
ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor).

Further explanations:
PC31 Polishes and wax blends.
- CS2: AISE C20 Furniture floor and leather care: waxes and creams (floor, furniture, shoes).
- CS3: AISE C20 Furniture floor and leather care: spray (furniture, shoes).

For further information on standardized use descriptors see the European Chemical Agency (ECHA) Guidance on information requirements and chemical safety assessment, Chapter R.12: Use descriptor system (http://guidance.echa.europa.eu/docs/guidance_document/information_requirements_r12_en.pdf).

2. Conditions of use affecting exposure

2.1 Control of consumer exposure

Product characteristics:
Concentration of substance in mixture/article: <= 0,1%.
Exposure via inhalation route: Yes.
Exposure via dermal route: Yes.
Oral contact foreseen: No.
Spray: CS2: No. CS3: Yes.

Amounts used:
Applied amounts for each use event:
- CS2: 550 g.
- CS3: Inhalation mass generation rate 1,8 g/sec for spray duration <= 2 minutes.

Frequency and duration of use/exposure:
Duration covers exposure up to 4 hours/event.
Frequency - covers use frequency: up to 1 time/day; frequent use per year.

Human factors not influenced by risk management:
Body parts potentially exposed: Hands.
Inhalation factor = 1.
Dermal transfer factor=1.

Other given operational conditions affecting consumers exposure:
Location: Indoor use.
Body weight: 60 kg.
Inhalation exposure model - covers use in room size of: CS3: 20 m3.

Conditions and measures related to information and behavioral advice to consumers:
Assessment tool used: Fragrance concentration in fragranced end-product from the IFRA guidance (2012) is used at Tier 1.5 level consumer risk assessment.
- CS2: ECETOC TRA v3.1 (R15) model (consumer module.
- CS3: ECETOC TRA v3.1 (R15) model (consumer module) and ConsExpo web v1.0.6.

Conditions and measures related to personal protection and hygiene:
General ventilation: CS3: ventilation rate >= 0,6 air changes/ hour.

2.2 Control of environmental exposure

General:
All risk management measures utilised must also comply with all relevant local regulations.

Amounts used:
Daily wide dispersive use: 0,0000055 tons/day.
Fraction of the main local source: 0,002.
Percentage of tonnage used at regional scale: 10 %.

Frequency and duration of use:
Emission days: <=365 days/year.
Wide dispersive use.

Environmental factors not influenced by risk management:
Flow rate of receiving surface water: >=18,000 m3/day (default).

Other given operational conditions affecting environmental exposure:
Indoor use.
Consumer use.
Release fraction to air from process (initial release): 1,00; (final release): 1,00.
Release fraction to wastewater from process (initial release): 1,00; (final release): 1,00. Local release rate: 0,0055 kg/day.
Release fraction to soil from process (final release): 0.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil:
Dry sludge application to agricultural soil: Yes (default).

Conditions and measures related to municipal sewage treatment plant:
Municipal Sewage Treatment Plant (STP): Yes (Efficiency=91.89%).
Size of municipal sewage system/treatment plant: >=2000 m3/day (standard town).

Conditions and measures related to external treatment of waste for disposal:
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)

Conditions and measures related to external recovery of waste:
External recovery and recycling of waste should comply with applicable local and/or national regulations.

Additional good practice advice:
All risk management measures utilised must also comply with all relevant local regulations.

3. Exposure estimation and reference to its source

Assessment method-Health: ECETOC TRA v3.1 (R15) model (consumer module) and CS3: ConsExpo web v1.0.6. Only highest figures are presented here.

Assessment method-Environment: CHESAR v3.4 - EUSES v2.1.2.

Health

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Consumer, long-term, systemic, Dermal	0,143 mg/kg bw/day	0,229	PC31 (CS2)
Consumer, long-term, systemic, Inhalation	0,1 mg/m3	0,108	PC31 (CS3)
Consumer, long-term, systemic, Oral	0 mg/kg bw/day	<0,01	PC31
Consumer, long-term, systemic, Combined routes	N/A	0,316	PC31 (CS2)

Environment

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Freshwater	0,0000359 mg/L	0,019	
Freshwater sediment	0,03 mg/kg dw	0,019	
Marine water	0,0000035 mg/L	0,018	
Marine water sediment	0,00294 mg/kg dw	0,018	
Soil	0,00683 mg/kg dw	0,022	
STP	0,000223 mg/L	<0,01	
Human via environment, Inhalation	0,00000361 mg/m3	<0,01	
Human via environment, Oral	0,00012 mg/kg bw/day	<0,01	
Human via environment, Combined routes	N/A	<0,01	

RCR=Risk characterization ratio (PEC/PNEC or Exposure estimate/DNEL); PEC=Predicted environmental concentration.

4. Guidance to the Downstream User to evaluate whether he works inside the boundaries set by the ES

Health: Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Environment: Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Exposure scenario (10): Consumer use - GES10 Consumer end-use of cosmetics

1. Exposure scenario (10)

Short title of the exposure scenario:
Consumer use - GES10 Consumer end-use of cosmetics

List of use descriptors:
Product category (PC): PC39
Environmental release category (ERC): ERC8a

Name of contributing environmental scenario and corresponding ERCs:
ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor).

Further explanations:
PC39 Cosmetics, personal care products.

For further information on standardized use descriptors see the European Chemical Agency (ECHA) Guidance on information requirements and chemical safety assessment, Chapter R.12: Use descriptor system (http://guidance.echa.europa.eu/docs/guidance_document/

information_requirements_r12_en.pdf).

2. Conditions of use affecting exposure

2.1 Control of consumer exposure

General:
For cosmetic and personal care products, risk assessment only required for the environment under REACH as human health is covered by alternative legislation.

2.2 Control of environmental exposure

General:
All risk management measures utilised must also comply with all relevant local regulations.

Amounts used:
Daily wide dispersive use: 0,000022 tons/day.
Fraction of the main local source: 0,002.
Percentage of tonnage used at regional scale: 10 %.

Frequency and duration of use:
Emission days: <=365 days/year.
Wide dispersive use.

Environmental factors not influenced by risk management:
Flow rate of receiving surface water: >=18,000 m3/day (default).

Other given operational conditions affecting environmental exposure:
Indoor use.
Consumer use.
Release fraction to air from process (initial release): 1,00; (final release): 1,00.
Release fraction to wastewater from process (initial release): 1,00; (final release): 1,00. Local release rate: 0,022 kg/day.
Release fraction to soil from process (final release): 0.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil:
Dry sludge application to agricultural soil: Yes (default).

Conditions and measures related to municipal sewage treatment plant:
Municipal Sewage Treatment Plant (STP): Yes (Efficiency=91.89%).
Size of municipal sewage system/treatment plant: >=2000 m3/day (standard town).

Conditions and measures related to external treatment of waste for disposal:
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)

Conditions and measures related to external recovery of waste:
External recovery and recycling of waste should comply with applicable local and/or national regulations.

Additional good practice advice:
All risk management measures utilised must also comply with all relevant local regulations.

3. Exposure estimation and reference to its source

Assessment method-Environment: CHESAR v3.4 - EUSES v2.1.2.

Environment

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Freshwater	0,000102 mg/L	0,054	
Freshwater sediment	0,086 mg/kg dw	0,054	
Marine water	0,0000101 mg/L	0,053	
Marine water sediment	0,00849 mg/kg dw	0,053	
Soil	0,027 mg/kg dw	0,086	
STP	0,000892 mg/L	<0,01	
Human via environment, Inhalation	0,00000369 mg/m3	<0,01	
Human via environment, Oral	0,000417 mg/kg bw/day	<0,01	
Human via environment, Combined routes	N/A	<0,01	

RCR=Risk characterization ratio (PEC/PNEC or Exposure estimate/DNEL); PEC=Predicted environmental concentration. For cosmetic and personal care products, risk assessment is not required under REACH as human health is covered by alternative legislation.

4. Guidance to the Downstream User to evaluate whether he works inside the boundaries set by the ES

Health:	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Environment:	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.