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

Revision date: 1/19/2022
Supercedes: 9/30/2021

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

1.1. Product identifier:

Product trade name:	Kalama* C-9 Aldehyde (Nonanal)
Company product number:	C9AW
UK REACH registration number:	UK-01-6163251102-0-0003
Substance name:	Nonanal
Substance identification number:	EC 204-688-5
Other means of identification:	32511; 1-Nonanal; Nonyl aldehyde

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

Uses:	Fragrance ingredient. Industrial applications. 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 Limited Dans Road Widnes, Cheshire WA8 0RF United Kingdom Telephone: +44 (0) 151 423 8000
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:

Allergic effects, EUH208
Hazardous to the aquatic environment, Chronic, category 3, H412

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): Not Applicable
Signal word: Not Applicable
Hazard statements:
EUH208 Contains alpha Tocopherol. May produce an allergic reaction.
H412 Harmful to aquatic life with long lasting effects.
Precautionary statements:
P273 Avoid release to the environment.
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
0000124-19-6	Nonanal	98-100	Aquatic Chronic 3	H412
0010191-41-0	alpha Tocopherol	0.1-<0.3	Skin Sens. 1B	H317

CAS-No.	Chemical Name	Weight%	UK REACH Registration No.	EC/List Number
0000124-19-6	Nonanal	98-100	UK-01-6163251102-0-0003	204-688-5
0010191-41-0	alpha Tocopherol	0.1-<0.3	Not Available	233-466-0

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

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 dry chemical, "alcohol" foam, carbon dioxide or water spray.

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

5.2. Special hazards arising from the substance or mixture:

Unusual fire/explosion hazards: Issue warning: combustible liquid. Eliminate all ignition sources. Ventilate the area. If spill is large, be prepared to isolate the hazard area. Deny access to the spill area to persons who are not involved in the cleanup and/or who have not been properly trained in spill management of hazardous/flammable liquids. Vapors may explode if ignited in an enclosed area. Run off to sewer may cause a fire or explosion hazard. Protect product from flames of any kind; maintain proper clearance when using heat devices, etc. Closed container may rupture (due to build up in pressure) when exposed to extreme heat. Product may burn if an ignition source is present. Combustion hazard: waste soaked with this product may heat to temperatures causing self-ignition if improperly discarded. Many aldehydes readily oxidize exothermically when exposed to air. Any clean up materials, like rags, towels, etc. should be washed with water with mild soap or laundered with mild detergent before proper disposal to avoid the potential temperature rise from oxidation.

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:

Use water/water spray to keep fire-exposed containers cool. Water spray may be used to flush spills away from exposures and to dilute spills to non-combustible mixtures. Do not flush combustible liquids into sewer as a fire or vapor explosion hazard may result. Never direct a hose stream directly onto a burning flammable/combustible liquid. Solid or straight hose stream will cause fire to spread if directed onto a burning spill or into an open container of burning liquid. 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. Eliminate ignition sources. Ventilate areas of spill. 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. Combustion hazard: waste soaked with this product may heat to temperatures causing self-ignition if improperly discarded. Immediately after use, rags, steel wool or other waste should be wetted or cleaned with water with mild soap or laundered with mild detergent or placed into a water-filled metal container before proper disposal.

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. Bond and ground all containers when transferring chemical. Eliminate ignition sources (e.g., sparks, static buildup, excessive heat, etc.). Use spark-proof tools and equipment. Vapors may travel to distant ignition sources.

7.2. Conditions for safe storage, including any incompatibilities:

Store in combustible storage area and away from heat and open flame. Keep away from heat, sparks and open flames. Store under well-ventilated conditions. Keep container upright, when not in use, to prevent leakage. Avoid storing containers in direct sunlight as vapors may accumulate in the head space creating pressure. 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. Emptied container may contain residual vapors or liquid which may ignite or explode. Do not reuse empty container without commercial cleaning or reconditioning. Bond and ground all containers when transferring chemical. Product can easily oxidize. It is recommended that opened containers be padded with nitrogen. Protect from light. Product can easily oxidize. It is recommended that opened containers be padded with nitrogen.

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
Nonanal	N/E	N/E
alpha Tocopherol	N/E	N/E

Chemical Name	UK WEL
Nonanal	N/E
alpha Tocopherol	N/E

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

Derived No Effect Levels (DNELs):

Nonanal

Population	Route	Acute (local)	Acute (systemic)	Long Term (local)	Long Term (systemic)
Workers	Inhalation	N/E	N/E	N/E	24,9 mg/m3
Workers	Dermal	N/E	N/E	N/E	7 mg/kg bw/day
General population	Inhalation	N/E	N/E	N/E	6,1 mg/m3
General population	Dermal	N/E	N/E	N/E	3,5 mg/kg bw/day
General population	Oral	N/E	N/E	N/E	3,5 mg/kg bw/day
Human via the environment	Inhalation	N/E	N/E	N/E	6,1 mg/m3
Human via the environment	Oral	N/E	N/E	N/E	3,5 mg/kg bw/day

Predicted No Effect Concentration (PNECs):

Nonanal

Compartment	PNEC
Freshwater	1,45 µg/L
Freshwater sediment	0,106 mg/kg dw
Marine water	0,145 µg/L
Marine water sediment	10,56 µg/kg dw
Intermittent releases	14,5 µg/L
Soil	20,22 µg/kg dw
STP	3,16 mg/L
Oral	313 mg/kg food

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. Eliminate ignition sources (e.g., sparks, static buildup, excessive heat, etc.).

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 240 minutes (protection class 5 or greater) are recommended. For brief contact or splash applications, gloves with breakthrough times of 10 minutes or greater are recommended (protection class 1 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. Colorless to pale yellow
Odour:	Aldehyde-like
Odour threshold:	Not Available
pH:	Not Available
Melting point/Freezing point:	-18.8 °C (-1.8 °F)
Initial boiling point and boiling range °C:	194 °C
Initial boiling point and boiling range °F:	381 °F
Flash point:	69 °C (156 °F) Setaflash
Evaporation rate:	Not Available
Flammability (solid, gas):	Not Applicable (liquid)
Upper/lower flammability or explosive limits:	LFL/LEL: Not Available UFL/UEL: Not Available
Vapour pressure:	2 hPa @ 20°C
Vapour density:	Not Available
Relative density:	0.819-0.827 (20°C)
Solubility in water:	101 mg/L @ 20°C
Partition coefficient (n-octanol/water):	3.4 (OECD 117)
Autoignition temperature:	195-200 °C (383-392 °F)
Decomposition temperature:	Not Available
Viscosity:	1.9 mm2/s @ 20°C; 1.4 mm2/s @ 40°C
Explosive properties:	Not explosive
Oxidising properties:	Not oxidizing
% Volatile By weight:	Not Available

VOC:	Not Available
Surface tension:	46.1 mN/m @ 20°C

9.2. Other information:

Amounts specified are typical and do not represent a specification.

SECTION 10: Stability and reactivity

10.1. Reactivity:

Presents no significant reactivity hazard. Neither pyrophoric nor reactive with water. Does not form explosive mixtures with other organic materials.

10.2. Chemical stability:

This product is stable. Normally stable even at elevated temperatures and pressures. Does not undergo explosive decomposition; is shock stable; and is not an oxygen donor. Readily undergoes oxidation by air.

10.3. Possibility of hazardous reactions:

Hazardous polymerization will not occur.

10.4. Conditions to avoid:

Excessive heat and ignition sources.

10.5. Incompatible materials:

Avoid strong acids, bases, and oxidizing agents. Avoid contact with reducing agents. Avoid contact with amines. May attack galvanized steel.

10.6. Hazardous decomposition products:

Carbon dioxide, carbon monoxide and hydrocarbons.

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: Repeated or prolonged skin contact may cause allergic reactions.

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

Ingestion: 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
Nonanal	N/E	N/E	>5000 mg/kg	Rat/ adult	>5000 mg/kg	Rabbit/ adult
alpha Tocopherol	N/E	N/E	>4000 mg/kg	Rat/ adult	>3000 mg/kg	Rat/ adult

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

Chemical Name	Skin irritation	Species
Nonanal	Mild-moderate irritant	Rabbit/ adult
alpha Tocopherol	Mild irritant	Rabbit/ adult

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

Chemical Name	Eye irritation	Species
Nonanal	Non-irritant	Rabbit/ adult
alpha Tocopherol	Slight irritant	Rabbit/ adult

Respiratory or skin sensitization: Not classified (based on available data, the classification criteria are not met).

Chemical Name	Skin sensitisation	Species
Nonanal	Non-sensitizer (read-across)	HRIPT (Human Repeat Insult Patch Test)
alpha Tocopherol	Sensitizer	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). NONANAL: Several In-vitro mutation (bacteria reverse mutation (Ames), mouse lymphoma, and DNA damage and repair) studies were negative

with and without metabolic activation. Nonanal had a positive result for an in vitro sister chromatid exchange assay. An in-vivo mouse micronucleus study for an analogue (read-across) substance (OECD 474, Undec-10-enal) did not show any evidence of causing chromosome damage when administered orally.

Reproductive toxicity: Not classified (based on available data, the classification criteria are not met). NONANAL - READ-ACROSS/WEIGHT OF EVIDENCE: Reproductive toxicity, oral study in rats: NOAEL (no-observed adverse-effect-level) of 200-300 mg/kg bw/day.

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). NONANAL-READ-ACROSS (DODECANAL): Repeated dose study, oral, rat: NOAEL (no-observed-adverse-effect-level) =1409.7 mg/kg bw/day.

Aspiration hazard: Not classified (based on available data, the classification criteria are not met).

Other toxicity information: No additional information available.

SECTION 12: Ecological information

12.1. Toxicity:

Chemical Name	Species	Acute	Acute	Chronic
Nonanal	Fish	LC50 1.45 mg/L (96 hours) (similar materials)	N/E	N/E
Nonanal	Invertebrates	EC50 1.54 mg/L (48 hours)	N/E	N/E
Nonanal	Algae	EC50 4.5 mg/L (72 hours)	N/E	NOEC 0.759 mg/L(72 hours)
Nonanal	Micro-organisms	EC50 70 mg/L (3 hours)		
alpha Tocopherol	Fish	LC50 >10 mg/L (96 hours)	N/E	N/E
alpha Tocopherol	Invertebrates	EC50 >100 mg/L (48 hours)	N/E	N/E
alpha Tocopherol	Algae	EC50 >25.8 mg/L (72 hours)	N/E	NOEC 25.8 mg/L(72 hours)
alpha Tocopherol	Micro-organisms	EC50 >927 mg/L (30 minutes) (similar materials)		

12.2. Persistence and degradability:

Readily biodegradable (OECD 301F).

Chemical Name	Biodegradation
Nonanal	Readily biodegradable (OECD 301F)
alpha Tocopherol	Inherently biodegradable (OECD 301F)

12.3. Bioaccumulative potential:

Log Pow: 3.4 (OECD 117).

Chemical Name	Bioconcentration Factor (BCF)	Log Kow
Nonanal	94 L/kg (calculated)	3.4 (OECD 117)
alpha Tocopherol	N/E	12.2 (calculated)

12.4. Mobility in soil:

KOC=692 (OECD 121).

Chemical Name	Mobility in soil (Koc/Kow)
Nonanal	692 (OECD 121)
alpha Tocopherol	N/E

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: N/A

14.2. UN proper shipping name:

Not regulated - See Bill of Lading for Details

14.3. Transport hazard class(es):

U.S. DOT hazard class: Combustible liquid
Canada TDG hazard class: N/A
Europe ADR/RID hazard class: N/A
IMDG Code (ocean) hazard class: N/A
ICAO/IATA (air) hazard class: N/A

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

14.4. Packing group: N/A

14.5. Environmental hazards:

Marine pollutant: Not Applicable

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 shipments within the United States, in containers of more than 119 gallons: Combustible liquid, N.O.S., NA 1993, PG III.

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. 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. 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.
H412	Harmful 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: Nonanal.
EC# 204-688-5 / CAS# 124-19-6
UK REACH Registration number: UK-01-6163251102-0-0003
EU REACH Registration number: 01-2119969440-35-0006

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:

This product is a liquid fragrance ingredient used in a wide variety of fragranced end-products, including washing, cleaning and cosmetic products. It functions as an odour agent. Formulated fragranced products for industrial, professional and consumer uses contain less than 1%. The neat substance is mixed with other fragrance ingredients to form a fragrance compound (compounding) followed by the formulation of the compound into a fragranced end-product (formulation).

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). A.I.S.E. 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 3.2 (CHESAR v3.2). 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 first tier worker exposure assessments have at first instance been performed using Worker TRA v3 which is part of Chemical Safety Assessment and Reporting tool version 3.2 (CHESAR v3.2).

The Consumer TRA v3 (R15) tool has been used to estimate consumer exposures..

Reference: IFRA REACH Exposure scenarios for Fragrance Substances. Version 2.1/11 December 2012.

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:
- PROC1, PROC3, PROC5, PROC15: <=100%
- PROC8a, PROC8b, PROC9: <=25%

Physical state: liquid.
Vapour pressure: 2 hPa at 20°C.

Amounts used:
This information is not relevant for assessment of worker's exposure.

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, PROC9: 480 cm2 (two hands, face side only).
- PROC8a, PROC8b: 960 cm2 (two hands).

Other given operational conditions affecting workers exposure:
Location: Indoor use.
Domain: Industrial use.
Process temperature: <= 40 °C.

Technical conditions and measures to control dispersion from source towards the worker:
General ventilation:
- PROC1, PROC3, PROC5, PROC8b: Basic general ventilation (1-3 air changes per hour): 0%.
- PROC8a, PROC9, PROC15: Enhanced general ventilation (5-10 air changes per hour): 70%.

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:
- PROC1, PROC15: Not required.
- PROC3, PROC5, PROC8a, PROC9: Yes (90% effectiveness).
- PROC8b: 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, PROC3, PROC5, PROC8b, PROC9, PROC15: Not required.
- PROC8a: Yes (Respirator with APF of 10) (Effectiveness Inhalation: 90%).
Dermal protection: Yes (chemically resistant gloves conforming to EN374 with basic employee training) (minimum efficiency 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:
Environmental release may vary depending on the size of the compounding site according to IFRA guideline (2012). It is not more than 0.5% of the use volume for smaller compounding sites, whereas for large/medium sites it is not more than 0.2%.
All risk management measures utilised must also comply with all relevant local regulations.

Product characteristics:
Physical state: liquid.
Vapour pressure: 2 hPa at 20°C.

Amounts used:
Maximum daily use at a site: 0,1 ton/day.
Maximum annual use at a site: 25 tons/year.
Amounts used in the EU: 100 tons/year.

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: 2,5 kg/day (ERC).
Release fraction to wastewater from process (initial release): 0.002; (final release): 0.002. Local release rate: 0.2 kg/day (SpERC IFRA 2.1a.v1)
Release fraction to soil from process (final release): 0.0 (SpERC IFRA 2.1a.v1; 2.1b.v1).
Release fraction to soil from process (final release): 0.

Technical conditions and measures at process level (source) to prevent release:
Sites have impermeable floors.

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=92,45%).
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: Worker TRA v3. Only highest figures are presented here.

Assessment method-Environment: CHESAR v3.2 - EUSES v2.1.2.

Health

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Worker, long-term, systemic, Dermal	1,371 mg/kg bw/day	0,196	PROC5
Worker, long-term, systemic, Inhalation	1,778 mg/m3	0,071	PROC5
Worker, long-term, systemic, Combined routes	N/A	0,267	PROC5

Environment

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Freshwater	0,000765 mg/L	0,528	
Freshwater sediment	0,056 mg/kg dw	0,528	
Marine water	0,0000763 mg/L	0,527	
Marine water sediment	0,00556 mg/kg dw	0,526	
Soil	0,015 mg/kg dw	0,754	
STP	0,00755 mg/L	<0,01	
Human via environment, Inhalation	0,000478 mg/m3	<0,01	

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Human via environment, Oral	0,000131 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. Indoor use, PROC3, PROC5, PROC8a, PROC8b, PROC9: LEV used, with gloves. Respiratory protection: PROC1, PROC3, PROC5, PROC8b, PROC9, PROC15: Not required. PROC8a: Yes (Respirator with APF of 10) (Effectiveness Inhalation: 90%). Concentration of substance: PROC1, PROC3, PROC5, PROC15: <=100%. PROC8a, PROC8b, 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 and Cosmetics Europe (CE)).

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:
- IFRA SG-1: AISE Granular and low viscosity liquids (large site)(AISE 2.1.a,g).
- IFRA SG-2: AISE Granular and low viscosity liquids (medium site)(AISE 2.1.b,h).
- IFRA SG-3: AISE Granular and low viscosity liquids (small site)(AISE 2.1.c,i).
- IFRA SG-4: AISE High viscosity liquids+CE/AISE Solid products+CE Low viscosity liquids (large site)(AISE 2.1.j+CE/AISE 2.3.a+CE2.1.a).
- IFRA SG-5: AISE High viscosity liquids+CE/AISE Solid products+CE Low viscosity liquids (medium site)(AISE 2.1.k+CE/AISE 2.3.b+CE2.1.b).
- IFRA SG-6: AISE High viscosity liquids+CE/AISE Solid products+CE Low viscosity liquids (small site)(AISE 2.1.l+CE/AISE 2.3.c+CE2.1.c).
- IFRA SG-7: AISE + CE Fine fragrances (cleaning with solvent)(large/medium/small site)(CE 2.2a-c).
- IFRA SG-8: ERC2 default (large/medium/small site)(CE 2.1.d-j).

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:
- PROC1, PROC3, PROC5, PROC8b, PROC15: <=25%
- PROC8a, PROC9, PROC14: <=1%

Physical state: liquid.
Vapour pressure: 2 hPa at 20°C.

Amounts used:
This information is not relevant for assessment of worker's exposure.
Workers may handle amounts of fragrance end-product in the kg-range per day.

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).
- PROC5, PROC9, PROC14: 480 cm2 (two hands, face side only).
- PROC8a, PROC8b: 960 cm2 (two hands).

Other given operational conditions affecting workers exposure:
Location: Indoor use.
Domain: Industrial use.
Process temperature: <= 40 °C.

Technical conditions and measures to control dispersion from source towards the worker:
General ventilation:
- PROC1, PROC8a, PROC9, PROC14: Basic general ventilation (1-3 air changes per hour): 0%.
- PROC3, PROC5, PROC8b, PROC15: Enhanced general ventilation (5-10 air changes per hour): 70%.
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:
- PROC1: Not required.
- PROC3, PROC5, PROC8a, PROC9, PROC14, PROC15: Yes (90% effectiveness).
- PROC8b: 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: Not required.
Dermal protection:
- PROC1: No (Effectiveness Dermal: 0%).
- PROC3, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15: 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.
Vapour pressure: 2 hPa at 20°C.

Amounts used:
Maximum daily use at a site:
- IFRA SG-1: 0,15 tons/day.
- IFRA SG-2: 0,056 tons/day.
- IFRA SG-3: 0,046 tons/day.
- IFRA SG-4: 0,042 tons/day.
- IFRA SG-5, IFRA SG-6: 0,018 tons/day.
- IFRA SG-7: 0,064 tons/day.
- IFRA SG-8: 0,006 tons/day.
Maximum annual use at a site:
- IFRA SG-1: 37,5 tons/year.
- IFRA SG-2: 14 tons/year.
- IFRA SG-3: 11,5 tons/year.
- IFRA SG-4: 10,5 tons/year.
- IFRA SG-5, IFRA SG-6: 4,5 tons/year.
- IFRA SG-7: 16 tons/year.
- IFRA SG-8: 1,5 tons/year.

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:
- IFRA SG-1: (initial release): 0,0001; (final release): 0,0001. Local release rate: 0,015 kg/day.
- IFRA SG-2: (initial release): 0,001; (final release): 0,001. Local release rate: 0,056 kg/day.
- IFRA SG-3: (initial release): 0,002; (final release): 0,002. Local release rate: 0,092 kg/day.
- IFRA SG-4: (initial release): 0,001; (final release): 0,001. Local release rate: 0,042 kg/day.
- IFRA SG-5: (initial release): 0,002; (final release): 0,002. Local release rate: 0,036 kg/day.
- IFRA SG-6: (initial release): 0,004; (final release): 0,004. Local release rate: 0,072 kg/day.
- IFRA SG-7: (initial release): 0,0; (final release): 0,0. Local release rate: 0 kg/day.
- IFRA SG-8: (initial release): 0,02; (final release): 0,02. Local release rate: 0,12 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=92,45%).
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: Worker TRA v3. Only highest figures are presented here.

Assessment method-Environment: CHESAR v3.2 - EUSES v2.1.2.

Health

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Worker, long-term, systemic, Dermal	0,823 mg/kg bw/day	0,118	PROC5, PROC8b
Worker, long-term, systemic, Inhalation	0,356 mg/m3	0,014	PROC8a
Worker, long-term, systemic, Combined routes	N/A	0,13	PROC5

Environment

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Freshwater	0,000464 mg/L	0,32	ERC2 (SG-8)
Freshwater sediment	0,034 mg/kg dw	0,32	ERC2 (SG-8)
Marine water	0,0000462 mg/L	0,318	ERC2 (SG-8)
Marine water sediment	0,00336 mg/kg dw	0,318	ERC2 (SG-8)
Soil	0,00912 mg/kg dw	0,451	ERC2 (SG-8)
STP	0,00453 mg/L	<0,01	ERC2 (SG-8)
Human via environment, Inhalation	0,0000077 mg/m3	<0,01	ERC2 (SG-8)
Human via environment, Oral	0,0000773 mg/kg bw/day	<0,01	ERC2 (SG-8)
Human via environment, Combined routes	N/A	<0,01	ERC2 (SG-8)

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. Indoor use, LEV used, with gloves, no respirator required. Concentration of substance: 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:
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:
ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article).

Further explanations:
Industrial use of Laundry products:
- CS1 (AISE P101) Laundry detergent: Automatic process (PROC2, PROC8b).
- CS2 (AISE P104) Conditioner (softener/starch): Automatic process (PROC2, PROC8b).
- CS3 (AISE P107) Laundry aid (gasing): Automatic process (PROC2, PROC8b).
- CS4 (AISE P110) Laundry aid (non-gasing): Automatic process (PROC2, PROC8b).

Industrial use of Vehicle cleaning Products:
- CS5 (AISE P707) Train cleaner: Semi-Automatic process (PROC4, PROC8b).
- CS6 (AISE P708) Aeroplane cleaner: Semi-Automatic process (PROC4, PROC8b).
- CS7 (AISE P709) Car wash product: Semi-Automatic process (PROC4, PROC8b).
- CS8 (AISE P710) Car wash product: Spray and rinse process (PROC8b).
- CS9 (AISE P711) Car wash product: Spray and wipe manual process (PROC8b, PROC10)
- CS10 (AISE P712) Dewaxing product: Semi-Automatic process (PROC4, PROC8b).
- CS11 (AISE P713) Boat cleaning: Semi-Automatic process (PROC8b, PROC10).
- CS12 (AISE P714) Boat cleaning: Spray and wipe manual process (PROC8b, PROC10).

Industrial use of Food beverage and pharmacos products:
- CS13 (AISE P801) Food process cleaner: Cleaning In Place process (PROC1, PROC8b).
- CS14 (AISE P802) Food process cleaner: Semi closed cleaning process (PROC4, PROC8b).
- CS15 (AISE P803) Chain maintenance product: Automatic spray process (PROC7, PROC8b).
- CS16 (AISE P804) Chain maintenance product: Automatic drip and brush process (PROC13).
- CS17 (AISE P805) Defoaming product: Automatic process (PROC1, PROC8b).
- CS18 (AISE P806) Foam cleaner: Semi-Automatic with venting process (PROC7, PROC8b).
- CS19 (AISE P807) Foam cleaner: Semi-Automatic without venting process (PROC7, PROC8b).
- CS20 (AISE P809) Animal housing care: Semi-Automatic process (PROC7, PROC8b).
- CS21 (AISE P810) Disinfection product: Semi-Automatic process (PROC4, PROC8b).
- CS22 (AISE P811) Disinfection product: Fogging and gassing Semi-automatic process (PROC7, PROC8b).

Industrial use of Water treatment products:
- CS23 (AISE P904) Preservation and sanitation agent: drink and pool water (PROC4, PROC8b).
- CS24 (AISE P905) Preservation and sanitation agent: waste water (PROC4, PROC8b).

Industrial Use of Facade/surface Cleaning Products:
- CS25 (AISE P906) Facade/surface cleaner: High pressure process (PROC8b).
- CS26 (AISE P907) Facade/surface cleaner: Medium pressure process (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). 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: <=1%.
Physical state: liquid.
Vapour pressure: 2 hPa at 20°C.

Amounts used:
This information is not relevant for assessment of worker's exposure.

Frequency and duration of use/exposure:
Duration of activity:
- PROC1, PROC2, PROC4, PROC7, PROC10, PROC13: <=8 hours/day.
- PROC8b (CS5-CS12, CS18-CS22): <=1 hour/day.
- PROC8b (CS1-CS4, CS13-CS15, CS17, CS23-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).
- 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.

Technical conditions and measures to control dispersion from source towards the worker:
General ventilation:
- PROC8b (CS18), PROC13: Basic general ventilation (1-3 air changes per hour): 0%.
- PROC1, PROC2: Good general ventilation (3-5 air changes per hour): 30%.
- PROC4 (CS21), PROC7, PROC8b (CS1-CS4, CS13-CS15, CS17, CS20, CS21): Enhanced general ventilation (5-10 air changes per hour): 70%.
- PROC4 (CS5-CS7, CS10, CS14, CS23, CS24), PROC8b (CS5- CS12, CS19, CS22, CS23-CS26), 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).
- PROC8b (CS18): 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: Unless otherwise stated, Not required.
- PROC4 (CS5-CS7, CS10, CS14, CS23, CS24), PROC8b (CS5-CS12, CS19, CS22-CS26), PROC10: Yes (Respirator with APF of 10) (Effectiveness Inhalation: 90%).
- PROC7: Yes (Respirator with APF of 20) (Effectiveness Inhalation: 95%).
Dermal protection: Unless otherwise stated, No (Effectiveness Dermal: 0%).
- PROC7, PROC8b, PROC10, PROC13: 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:
Industrial use is considered as wide dispersive use together with the other end-uses of fragranced products. Industrial end-use products are similar to those used by professionals and consumers and releases will be to the waste water stream (IFRA 2012).
All risk management measures utilised must also comply with all relevant local regulations.

Product characteristics:
Physical state: liquid.
Vapour pressure: 2 hPa at 20°C.

Amounts used:
Daily wide dispersive use: 0,000055 tons/day.

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.
Industrial 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: 0,055 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=92,45%).
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: Worker TRA v3. Only highest figures are presented here.

Assessment method-Environment: CHESAR v3.2 - EUSES v2.1.2.

Health

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Worker, long-term, systemic, Dermal	0,686 mg/kg bw/day	0,098	PROC4
Worker, long-term, systemic, Inhalation	0,889 mg/m3	0,036	PROC4 (CS21), PROC7
Worker, long-term, systemic, Combined routes	N/A	0,134	PROC4 (CS21)

Environment

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Freshwater	0,000219 mg/L	0,151	
Freshwater sediment	0,016 mg/kg dw	0,151	
Marine water	0,0000217 mg/L	0,149	
Marine water sediment	0,00158 mg/kg dw	0,149	
Soil	0,00418 mg/kg dw	0,207	
STP	0,00208 mg/L	<0,01	
Human via environment, Inhalation	0,00000572 mg/m3	<0,01	
Human via environment, Oral	0,0000474 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. Indoor/outdoor use, PROC8b (CS18), PROC13: LEV used, PROC7, PROC8b, PROC10, PROC13: with gloves. Respiratory protection: PROC4 (CS5-CS7, CS10, CS14, CS23, CS24), PROC8b (CS5-CS12, CS19, CS22-CS26), PROC10: Yes (Respirator with APF of 10) (Effectiveness Inhalation: 90%). PROC7: Yes (Respirator with APF of 20) (Effectiveness Inhalation: 95%). Concentration of substance: Up to 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:
Product category (PC): PC35
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:
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:
ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor).

Further explanations:
Professional Use of Laundry products:
- CS1 (AISE P102) Laundry detergent: Semi-automatic process (PROC1, PROC8a).
- CS2 (AISE P103) Laundry detergent: Manual process (PROC8a, PROC10).
- CS3 (AISE P105) Conditioner (softener/starch): Semi-automatic process (PROC1, PROC8a).
- CS4 (AISE P108) Laundry aid (gasing): Semi-automatic process (PROC1, PROC8a).
- CS5 (AISE P111) Laundry aid (non-gasing): Semi-automatic process (PROC1, PROC8a).
- CS6 (AISE P112) Laundry aid (non-gasing): Manual process (PROC4, PROC8a).
- CS7 (AISE P113) Prespotter/Stain remover: Manual process (PROC10, PROC11).

Professional Use of Dishwash products:
- CS8 (AISE P201) Dishwash product: Manual process (PROC8a, PROC10).

- CS9 (AISE P202) Rinse aid: Automatic process (PROC2, PROC8b).
- CS10 (AISE P203) Dishwash product: Semi-automatic process (PROC1, PROC8a).
- CS11 (AISE P204) Rinse aid: Semi-automatic process (PROC1, PROC8a).

Professional Use of General surface cleaning products:
- CS12 (AISE P301) General purpose cleaner: Manual process (PROC8a, PROC10).
- CS13 (AISE P302) General purpose cleaner: Spray and wipe manual process (PROC8a, PROC10, PROC11).
- CS14 (AISE P303) Kitchen cleaner: Manual process (PROC8a, PROC10).
- CS15 (AISE P304) Kitchen cleaner: Spray and wipe manual process (PROC8a, PROC10, PROC11).
- CS16 (AISE P305) Sanitary cleaner: Manual process (PROC8a, PROC10).
- CS17 (AISE P306) Sanitary cleaner: Spray and wipe manual process (PROC8a, PROC10, PROC11).
- CS18 (AISE P307) Descaling agent: Manual process (PROC10).
- CS19 (AISE P308) Descaling agent: Spray and rinse manual process (PROC8a, PROC10, PROC11).
- CS20 (AISE P309) General surface cleaning: Periodic cleaning by dipping: (PROC8a, PROC13).
- CS21 (AISE P310) Oven/Grill cleaner: Manual process (PROC10).
- CS22 (AISE P311) Oven/Grill Cleaner: Spray and wipe manual process (PROC10, PROC11).
- CS23 (AISE P312) Glass cleaner: Manual process (PROC8a, PROC10).
- CS24 (AISE P313) Glass cleaner: Spray and wipe manual process (PROC10, PROC11).
- CS25 (AISE P314) Surface disinfectant: Manual process (PROC8a, PROC10).
- CS26 (AISE P315) Surface disinfectant: Spray and rinse manual process (PROC8a, PROC10, PROC11).
- CS27 (AISE P316) Metal cleaning agent: Manual process (PROC10).
- CS28 (AISE P317) Surface cleaning: Wet wipes manual process (PROC10).

Professional Use of Floor care products:
- CS29 (AISE P401) Floor cleaner: Semi-Automatic process (PROC8a, PROC10).
- CS30 (AISE P402) Floor cleaner: Spray and wipe manual process (PROC8a, PROC10, PROC11).
- CS31 (AISE P403) Floor cleaner: Manual process (PROC8a, PROC10).
- CS32 (AISE P404) Floor stripper: Manual process (PROC8a, PROC10).
- CS33 (AISE P405) Floor stripper: Semi-Automatic process (PROC8a, PROC10).
- CS34 (AISE P409) Carpet cleaner: Manual process (PROC8a, PROC10).
- CS35 (AISE P410) Carpet cleaner: Semi-Automatic process (PROC8a, PROC10).
- CS36 (AISE P411) Carpet cleaner: Prespotter, brush manual process (PROC10, PROC11).

Professional Use of Maintenance Products :
- CS37 (AISE P606) Drain unblocker: Manual process (PROC13).
- CS38 (AISE P607) Drain cleaner: Manual process (PROC13).

Professional Use of Vehicle cleaning Products:
- CS39 (AISE P701) Car wash product: Semi-Automatic process (PROC4, PROC8a).
- CS40 (AISE P702) Car wash product: Spray manual process (PROC8a, PROC11).
- CS41 (AISE P703) Car wash product: Spray and wipe manual process (PROC8a, PROC10, PROC11).
- CS42 (AISE P704) Dewaxing product: Semi-Automatic process (PROC4, PROC8a).
- CS43 (AISE P705) Boat cleaner: Manual process (PROC8a, PROC10).
- CS44 (AISE P706) Boat cleaner: Spray and wipe manual process (PROC8a, PROC10, PROC11).

Professional Use of Food beverage and pharmacos products:
- CS45 (AISE P808) Animal housing care: Manual process (PROC8a, PROC10).

Professional Use of Facade/surface Cleaning Products:
- CS46 (AISE P901) Facade/surface cleaner: High pressure process (PROC8a, PROC11).
- CS47 (AISE P902) Facade/surface cleaner: Medium pressure process (PROC8a, PROC10, PROC11).

Professional Use of Medical Devices:
- CS48 (AISE P1101) Medical devices: Semi-automatic process (PROC1, PROC8a).
- CS49 (AISE P1102) Medical devices: Dipping process (PROC8a, PROC13).
- CS50 (AISE P1103) Medical devices: Manual process (PROC8a, PROC10).
- CS51 (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). 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: <=1%.
Physical state: liquid.
Vapour pressure: 2 hPa at 20°C.

Amounts used:
This information is not relevant for assessment of worker's exposure.

Frequency and duration of use/exposure:
Duration of activity:
- PROC1, PROC2, PROC4, PROC7, PROC8a, PROC8b, PROC10: <=8 hours/day.
- PROC11, PROC13 (CS20, CS49): <=1 hour/day.
- PROC13 (CS37, CS38): <=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, PROC8b, PROC10: 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.

Technical conditions and measures to control dispersion from source towards the worker:
General ventilation:
- PROC1: Basic general ventilation (1-3 air changes per hour): 0%.
- PROC4, PROC8b: Good general ventilation (3-5 air changes per hour): 30%.
- PROC2, PROC8a, PROC10, PROC11, PROC13: Enhanced general ventilation (5-10 air changes per hour): 70%.

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.
- PROC4, PROC8a, PROC8b, PROC10, PROC13: Yes (Respirator with APF of 10) (Effectiveness Inhalation: 90%).
- PROC11: Yes (Respirator with APF of 20) (Effectiveness Inhalation: 95%).

Dermal protection: Unless otherwise stated, Yes (chemically resistant gloves conforming to EN374 with basic employee training) (Effectiveness Dermal: 90%).
- PROC1, PROC2, PROC4: No (Effectiveness Dermal: 0%).

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.
Vapour pressure: 2 hPa at 20°C.

Amounts used:
Daily wide dispersive use: 0,000055 tons/day.

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: 0,055 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=92,45%).
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: Worker TRA v3. Only highest figures are presented here.

Assessment method-Environment: CHESAR v3.2 - EUSES v2.1.2.

Health

Effect/Compartment	Exposure estimate/PEC	RCR	Notes

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Worker, long-term, systemic, Dermal	1,071 mg/kg bw/day	0,153	PROC11
Worker, long-term, systemic, Inhalation	0,889 mg/m3	0,02	PROC2
Worker, long-term, systemic, Combined routes	N/A	0,16	PROC11

Environment

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Freshwater	0,000219 mg/L	0,151	
Freshwater sediment	0,016 mg/kg dw	0,151	
Marine water	0,0000217 mg/L	0,149	
Marine water sediment	0,00158 mg/kg dw	0,149	
Soil	0,00418 mg/kg dw	0,207	
STP	0,00208 mg/L	<0,01	
Human via environment, Inhalation	0,00000572 mg/m3	<0,01	
Human via environment, Oral	0,0000474 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. Indoor use, without LEV, with gloves. Respiratory protection: PROC4, PROC8a, PROC8b, PROC10, PROC13: Yes (Respirator with APF of 10) (Effectiveness Inhalation: 90%). PROC11: Yes (Respirator with APF of 20) (Effectiveness Inhalation: 95%). Concentration of substance: Up to 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:
Product category (PC): PC31
Process category (PROC): PROC2, PROC8b, PROC10, PROC11
Environmental release category (ERC): ERC8a

List of names of contributing worker scenarios and corresponding PROCs:
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:
ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor).

Further explanations:
Professional Use of Floor care products:
- CS1 (AISE P406) Polish/impregnating agent: Manual process (PROC10).
- CS2 (AISE P407) Polish/impregnating agent: Semi-Automatic process (PROC10).
- CS3 (AISE P408) Polish/impregnating agent: Spray and wipe manual process (PROC10, PROC11).

Professional Use of Maintenance Products :
- CS4 (AISE P601) Furniture care product: Manual process (PROC10).
- CS5 (AISE P602) Furniture care product: Spray and wipe manual process (PROC10, PROC11).
- CS6 (AISE P603) Leather care product: Manual process (PROC10).
- CS7 (AISE P604) Leather care product: Spray and wipe manual process (PROC10, PROC11).
- CS8 (AISE P605) Leather care product: Semi-automatic process (PROC2, PROC8b).
- CS9 (AISE P608) Stainless steel care: Manual process (PROC10).
- CS10 (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). 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: <=1%.
Physical state: liquid.
Vapour pressure: 2 hPa at 20°C.

Amounts used:
This information is not relevant for assessment of worker's exposure.

Frequency and duration of use/exposure:
Duration of activity:
- PROC2, PROC10 (CS1-CS3, CS9): <=8 hours/day.
- PROC10 (CS4-CS7, CS10): <=4 hours/day.
- PROC8b, PROC11 (CS3): <=1 hour/day.
- PROC11 (CS5, CS7, CS10): <=15 minutes/day.

Human factors not influenced by risk management:
Exposed skin surface:
- PROC2: 480 cm2 (two hands, face side only).
- PROC8b, PROC10: 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.

Technical conditions and measures to control dispersion from source towards the worker:
General ventilation:
- PROC2, PROC8b: Basic general ventilation (1-3 air changes per hour): 0%.
- PROC10: Good general ventilation (3-5 air changes per hour): 30%.
- PROC11: Enhanced general ventilation (5-10 air changes per hour): 70%.
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:
- PROC2, PROC8b: Yes (Respirator with APF of 10) (Effectiveness Inhalation: 90%).
- PROC10, PROC11: Yes (Respirator with APF of 20) (Effectiveness Inhalation: 95%).
Dermal protection: Yes (chemically resistant gloves conforming to EN374 with basic employee training) (minimum efficiency 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.
Vapour pressure: 2 hPa at 20°C.

Amounts used:
Daily wide dispersive use: 0,000055 tons/day.

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: 0,055 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=92,45%).
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: Worker TRA v3. Only highest figures are presented here.

Assessment method-Environment: CHESAR v3.2 - EUSES v2.1.2.

Health

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Worker, long-term, systemic, Dermal	1,071 mg/kg bw/day	0,153	PROC11
Worker, long-term, systemic, Inhalation	0,519 mg/m3	0,021	PROC10 (CS1-CS3, CS9)
Worker, long-term, systemic, Combined routes	N/A	0,16	PROC11

Environment

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Freshwater	0,000219 mg/L	0,151	
Freshwater sediment	0,016 mg/kg dw	0,151	
Marine water	0,0000217 mg/L	0,149	
Marine water sediment	0,00158 mg/kg dw	0,149	
Soil	0,00418 mg/kg dw	0,207	
STP	0,00208 mg/L	<0,01	
Human via environment, Inhalation	0,00000572 mg/m3	<0,01	
Human via environment, Oral	0,0000474 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. Indoor use, without LEV, with gloves. Respiratory protection: PROC2, PROC8b: Yes (Respirator with APF of 10) (Effectiveness Inhalation: 90%). PROC10, PROC11: Yes (Respirator with APF of 20) (Effectiveness Inhalation: 95%). Concentration of substance: Up to 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

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:
PC35 Washing and cleaning products.
- CS1 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).

- CS2 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).

- CS3 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).
- 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). 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 consumer exposure

Product characteristics:
Concentration of substance in mixture:
- CS1: <=0,15%.
- CS2, CS3: <=0,1%.

Physical state: liquid.
Vapour pressure: 2 hPa at 20°C.
Exposure via inhalation route: CS1, CS2: Not relevant. CS3: Yes.
Exposure via dermal route: Yes.
Oral contact foreseen: No.
Spray: CS1, CS2: No. CS3: Yes.

Amounts used:
Applied amounts for each use event: CS3: 30 g.

Frequency and duration of use/exposure:
Duration covers exposure (inhalation) up to 0,2 hour/event (CS3).
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 (CS3).
Dermal transfer factor=1.

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: 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 ECETOC TRA v3.1 with Specific Consumer Exposure Determinants (SCED) for PC35.

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.
Vapour pressure: 2 hPa at 20°C.

Amounts used:
Daily wide dispersive use: 0,000055 tons/day.

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: 0,055 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=92,45%).
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: TRA Consumer v3.1 (R15). Only highest figures are presented here.

Assessment method-Environment: CHESAR v3.2 - EUSES v2.1.2.

Health

Effect/Compartment	Exposure estimate/PEC	RCR	Notes

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Consumer, long-term, systemic, Dermal	0,214 mg/kg bw/day	0,061	PC35 (CS1)
Consumer, long-term, systemic, Inhalation	1,339 mg/m3	0,22	PC35 (CS3)
Consumer, long-term, systemic, Oral	0 mg/kg bw/day	<0,01	PC35
Consumer, long-term, systemic, Combined routes	N/A	0,26	PC35 (CS3)

Environment

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Freshwater	0,000219 mg/L	0,151	
Freshwater sediment	0,016 mg/kg dw	0,151	
Marine water	0,0000217 mg/L	0,149	
Marine water sediment	0,00158 mg/kg dw	0,149	
Soil	0,00418 mg/kg dw	0,207	
STP	0,00208 mg/L	<0,01	
Human via environment, Inhalation	0,00000572 mg/m3	<0,01	
Human via environment, Oral	0,0000474 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 (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:
ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor).

Further explanations:
PC3 Air care products:
- CS1 (AISE C17) Air fresheners aerosol (aqueous, non-aqueous, concentrated (mini-aerosol, timed release aerosol)).
- CS2 (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). 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 consumer exposure

Product characteristics:
Concentration of substance in mixture:
- CS1: <= 0,5%.
- CS2: <= 0,1%.
Physical state: liquid.
Vapour pressure: 2 hPa at 20°C.
Exposure via inhalation route: CS1: Yes. CS2: Not relevant.
Exposure via dermal route: CS1: Not relevant. CS2: Yes.
Oral contact foreseen: No.
Spray: CS1: Yes. CS2: No.

Amounts used:
Applied amounts for each use event: CS1: 10 g.

Frequency and duration of use/exposure:
Duration covers exposure (inhalation) up to 0,25 hour/event (CS1).
Frequency - covers use frequency: up to 1 time/day; frequent use per year.

Human factors not influenced by risk management:
Body parts potentially exposed:
- CS1: dermal exposure negligible compared to inhalation.
- CS2: fingertips.
Inhalation factor = 1 (CS1).
Dermal transfer factor=1 (CS2).

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: 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 ECETOC TRA v3.1 with Specific Consumer Exposure Determinants (SCED) for PC3.

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.
Vapour pressure: 2 hPa at 20°C.

Amounts used:
Daily wide dispersive use: 0,000055 tons/day.

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: 0,055 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=92,45%).
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: PC35 (CS3, CS5, CS7, CS8, CS10-CS14, CS16-CS18): TRA Consumer v3.1 (R15). PC35 (CS2, CS4, CS6, CS9, CS15): AISE REACT 1.0 Consumer Tool. Only highest figures are presented here.

Assessment method-Environment: CHESAR v3.2 - EUSES v2.1.2.

Health

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Consumer, long-term, systemic, Dermal	0,0025 mg/kg bw/day	<0,01	PC3 (CS2)
Consumer, long-term, systemic, Inhalation	2,174 mg/m3	0,356	PC3 (CS1)
Consumer, long-term, systemic, Oral	0 mg/kg bw/day	<0,01	PC3
Consumer, long-term, systemic, Combined routes	N/A	0,356	PC3 (CS1)

Environment

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Freshwater	0,000219 mg/L	0,151	
Freshwater sediment	0,016 mg/kg dw	0,151	
Marine water	0,0000217 mg/L	0,149	
Marine water sediment	0,00158 mg/kg dw	0,149	
Soil	0,00418 mg/kg dw	0,207	
STP	0,00208 mg/L	<0,01	
Human via environment, Inhalation	0,00000572 mg/m3	<0,01	
Human via environment, Oral	0,0000474 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 (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

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:
PC8 Biocidal products:
- CS1 (AISE C19) Insecticides (spray neat, liquid electric).
- CS2 (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). 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 consumer exposure

Product characteristics:
Concentration of substance in mixture:
- CS1: <= 0,1%.
- CS2: <= 0,05%.
Physical state: liquid.
Vapour pressure: 2 hPa at 20°C.
Exposure via inhalation route: Yes.
Exposure via dermal route: Yes.
Oral contact foreseen: No.
Spray: CS1 Insecticides (liquid electric): No. CS1 Insecticides (spray neat), CS2: Yes.

Amounts used:
Applied amounts for each use event: 20 g.

Frequency and duration of use/exposure:
Duration covers exposure up to: 0,02 hours/event.
Frequency - covers use frequency: up to 1 time/day; infrequent use per year.

Human factors not influenced by risk management:
Body parts potentially exposed: Upper part of the body.
Inhalation factor = 1.
Dermal transfer factor=1.

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

Conditions and measures related to information and behavioral advice to consumers:
Assessment tool used: 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 ECETOC TRA v3.1 with Specific Consumer Exposure Determinants (SCED) for PC8.

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.
Vapour pressure: 2 hPa at 20°C.

Amounts used:
Daily wide dispersive use: 0,000055 tons/day.

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: 0,055 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=92,45%).
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: TRA Consumer v3.1 (R15). Only highest figures are presented here.

Assessment method-Environment: CHESAR v3.2 - EUSES v2.1.2.

Health

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Consumer, long-term, systemic, Dermal	1,458 mg/kg bw/day	0,417	PC8 (CS1)
Consumer, long-term, systemic, Inhalation	0,988 mg/m3	0,162	PC8 (CS1)
Consumer, long-term, systemic, Oral	0 mg/kg bw/day	<0,01	PC8
Consumer, long-term, systemic, Combined routes	N/A	0,579	PC8 (CS1)

Environment

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Freshwater	0,000219 mg/L	0,151	
Freshwater sediment	0,016 mg/kg dw	0,151	
Marine water	0,0000217 mg/L	0,149	
Marine water sediment	0,00158 mg/kg dw	0,149	
Soil	0,00418 mg/kg dw	0,207	
STP	0,00208 mg/L	<0,01	
Human via environment, Inhalation	0,00000572 mg/m3	<0,01	
Human via environment, Oral	0,0000474 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 (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:
ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor).

Further explanations:
PC31 Polishes and wax blends.
- CS1 (AISE C20) Furniture floor and leather care: waxes and creams (floor, furniture, shoes).
- CS2 (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). 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 consumer exposure

Product characteristics:
Concentration of substance in mixture:
- CS1: <= 0,5%.
- CS2: <= 0,1%.

Physical state: liquid.
Vapour pressure: 2 hPa at 20°C.
Exposure via inhalation route: Yes.
Exposure via dermal route: Yes.
Oral contact foreseen: No.
Spray: CS1: No. CS2: Yes.

Amounts used:
Applied amounts for each use event:

- CS1: 10 g.
- CS2: 135 g.

Frequency and duration of use/exposure:
Duration covers exposure up to:
- CS1: 4 hours/event.
- CS2: 1 hour/event.
Frequency - covers use frequency:
- CS1: up to 1 time/day; frequent use per year.
- CS2: up to 1 time/day; infrequent 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.

Conditions and measures related to information and behavioral advice to consumers:
Assessment tool used: 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 ECETOC TRA v3.1 with Specific Consumer Exposure Determinants (SCED) for PC31.

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.
Vapour pressure: 2 hPa at 20°C.

Amounts used:
Daily wide dispersive use: 0,000055 tons/day.

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: 0,055 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=92,45%).
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: TRA Consumer v3.1 (R15). Only highest figures are presented here.

Assessment method-Environment: CHESAR v3.2 - EUSES v2.1.2.

Health

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Consumer, long-term, systemic, Dermal	0,357 mg/kg bw/day	0,102	PC31 (CS1)
Consumer, long-term, systemic, Inhalation	4,219 mg/m3	0,692	PC31 (CS2)
Consumer, long-term, systemic, Oral	0 mg/kg bw/day	<0,01	PC31
Consumer, long-term, systemic, Combined routes	N/A	0,712	PC31 (CS2)

Environment

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Freshwater	0,000219 mg/L	0,151	
Freshwater sediment	0,016 mg/kg dw	0,151	
Marine water	0,0000217 mg/L	0,149	
Marine water sediment	0,00158 mg/kg dw	0,149	
Soil	0,00418 mg/kg dw	0,207	

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
STP	0,00208 mg/L	<0,01	
Human via environment, Inhalation	0,00000572 mg/m3	<0,01	
Human via environment, Oral	0,0000474 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): PC28, 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:
PC28 Perfumes, fragrances.
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). 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 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.

Product characteristics:
Physical state: liquid.
Vapour pressure: 2 hPa at 20°C.

Amounts used:
Daily wide dispersive use: 0,000055 tons/day.

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: 0,055 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=92,45%).
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 v3.2 - EUSES v2.1.2.

Environment

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Freshwater	0,000219 mg/L	0,151	
Freshwater sediment	0,016 mg/kg dw	0,151	
Marine water	0,0000217 mg/L	0,149	
Marine water sediment	0,00158 mg/kg dw	0,149	
Soil	0,00418 mg/kg dw	0,207	
STP	0,00208 mg/L	<0,01	
Human via environment, Inhalation	0,00000572 mg/m3	<0,01	
Human via environment, Oral	0,0000474 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.