

Safety Data Sheet

according to Regulation (EC) 1907/2006 (REACH)

Revision date: 2021-03-31
Supersedes date: 2021-02-09

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

1.1. Product identifier:

Product trade name: Kalama* Cyprinal
Company product number: CYPRINAL
REACH registration number: 01-2119538797-21-0000
Substance name: (2E)-2-Methyl-3-phenylacrylaldehyde
Substance identification number: EC 701-219-0
Other means of identification: 32143; Cinnamaldehyde, alpha-methyl-; 2-Propenal, 2-methyl-3-phenyl-; alpha-Methylcinnamic aldehyde; α-Methylcinnamaldehyde

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

Uses: Fragrance ingredient. Intermediate. Industrial applications. Professional applications. Consumer uses e.g. as a carrier in cosmetics/personal care products, perfumes and fragrances. See Annex for covered uses.
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
EU Only Representative: Penman Consulting bvba
Avenue des Arts 10
B-1210 Brussels
Belgium
Telephone: +32 (0) 2 403 7239
email: pcbvba10@penmanconsulting.com
Email: product.compliance@emeraldmaterials.com
For further information about this SDS:

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 Regulation (EC) 1272/2008 (CLP) as amended:

Skin Sensitizer, category 1, H317
See Section 2.2 for full text of H (Hazard) statements (EC 1272/2008).

2.2. Label elements:

Product labeling according to Regulation (EC) 1272/2008 (CLP) as amended:

Hazard pictogram(s):



Signal word:

Warning

Hazard statements:

H317 May cause an allergic skin reaction.

Precautionary statements:

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.

P280 Wear protective gloves.

P302+P352 IF ON SKIN: Wash with plenty of soap and water.

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P333+P313 If skin irritation or rash occurs: Get medical advice/attention.

P362+P364 Take off contaminated clothing and wash it before reuse.

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 ECHA 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.

Endocrine disrupting properties: No specific information available.

Other hazards: No Additional Information

See Section 11 for toxicological information.

SECTION 3: Composition/information on ingredients

3.1. Substance:

<u>CAS-No.</u>	<u>Chemical Name</u>	<u>Weight%</u>	<u>Classification</u>	<u>H Statements</u>
0000101-39-3	2-Methyl-3-phenylacrylaldehyde (α -Methylcinnamaldehyde)	99-100	Skin Sens. 1	H317
<u>CAS-No.</u>	<u>Chemical Name</u>	<u>REACH Registration No.</u>	<u>EC/List Number</u>	
0000101-39-3	2-Methyl-3-phenylacrylaldehyde (α -Methylcinnamaldehyde)	01-2119538797-21-0000	701-219-0 (202-938-8)	
<u>CAS-No.</u>	<u>Chemical Name</u>	<u>M-factor</u>	<u>SCLs</u>	<u>ATE</u>
0000101-39-3	2-Methyl-3-phenylacrylaldehyde (α -Methylcinnamaldehyde)	N/A	N/E	Not Available

See Section 16 for full text of H (Hazard) statements (EC 1272/2008).

Notes: 2-METHYL-3-PHENYLACRYLALDEHYDE: Alternative CAS# 15174-47-7 (EC 701-219-0, (2E)-2-Methyl-3-phenylacrylaldehyde).

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.

Following eye contact: Immediately flush eyes with plenty of clean water for an extended time, not less than fifteen (15) minutes. Flush longer if there is any indication of residual chemical in the eye. Ensure adequate flushing of the eyes by separating the eyelids with fingers and roll eyes in a circular motion. If eye irritation persists: Get medical advice/attention.

Following 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.

Following 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.

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

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

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

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

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

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media:

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

Unsuitable: None known.

5.2. Special hazards arising from the substance or mixture:

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

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

See section 9 for additional information.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures:

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

6.2. Environmental precautions:

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

6.3. Methods and material for containment and cleaning up:

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

7.2. Conditions for safe storage, including any incompatibilities:

Store cool and dry, under well-ventilated conditions. Store this material away from incompatible substances (see section 10). Do not store in open, unlabeled or mislabeled containers. Keep container closed when not in use. Do not reuse empty container without commercial cleaning or reconditioning. Shelf life: 24 months. Empty container contains residual product which may exhibit hazards of product. Product can easily oxidize. It is recommended that opened containers be padded with nitrogen.

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	EU OELV	EU IOELV	ACGIH - TWA/Ceiling	ACGIH - STEL
2-Methyl-3-phenylacrylaldehyde (α -Methylcinnamaldehyde)	N/E	N/E	N/E	N/E
Chemical Name	UK WEL	Ireland OEL		

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Chemical Name

2-Methyl-3-phenylacrylaldehyde (α -Methylcinnamaldehyde)

UK WEL

N/E

Ireland OEL

N/E

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

Derived No Effect Levels (DNELs):

2-Methyl-3-phenylacrylaldehyde (α -Methylcinnamaldehyde)

Population	Route	Acute (local)	Acute (systemic)	Long Term (local)	Long Term (systemic)
Workers	Inhalation	N/E	N/E	13,3 mg/m ³	13,3 mg/m ³
Workers	Dermal	3,5 mg/cm ²	N/E	3,5 mg/cm ²	2,21 mg/kg bw/day
General population	Inhalation	N/E	N/E	3,27 mg/m ³	3,27 mg/m ³
General population	Dermal	3,5 mg/cm ²	N/E	3,5 mg/cm ²	1,11 mg/kg bw/day
General population	Oral	N/E	N/E	N/E	1,11 mg/kg bw/day

Predicted No Effect Concentration (PNECs):

2-Methyl-3-phenylacrylaldehyde (α -Methylcinnamaldehyde)

Compartment	PNEC
Freshwater	0,0012 mg/L
Freshwater sediment	0,0404 mg/kg dw
Marine water	0,00012 mg/L
Marine water sediment	0,00404 mg/kg dw
Intermittent releases	0,012 mg/L
Soil	0,0071 mg/kg dw
STP	3,66 mg/L
Oral	No potential for bioaccumulation

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

8.2. Exposure controls:

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

Individual protection measures, such as personal protective equipment:

Eye/face protection: Wear eye protection.

Hand protection: Avoid skin contact when mixing or handling the material by wearing impervious and chemical resistant gloves. In case of prolonged immersion or frequently repeated contact, gloves with breakthrough times greater than 480 minutes (protection class 6) are recommended. For brief contact or splash applications, gloves with breakthrough times of 30 minutes or greater are recommended (protection class 2 or greater). Suggested materials for protective gloves: Butyl rubber, Nitrile rubber, PVC. The protective gloves to be used must comply with the specifications of the Regulation (EU) 2016/425 and the resultant 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. Gas mask with filter Type A.

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:

Physical state:	Liquid
Colour:	Clear yellow
Odour:	Almond-like
Odour threshold:	Not Available
Melting point/Freezing point:	<1.8°C (<35°F) @ 101.3 kPa
Boiling point °C:	254°C @ 101.3 kPa
Boiling point °F:	489°F @ 101.3 kPa
Flammability:	Not flammable
Lower and upper explosion limit:	LEL: Not Available UEL: Not Available
Flash point:	120 °C (248 °F) Pensky-Marten Closed Cup
Auto-ignition temperature:	248°C (478°F)
Decomposition temperature:	Not Available

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pH: Not Available
Kinematic viscosity: 4.0 mm²/s (4.156 mPa.s) @ 20°C
Solubility in water: Negligible
Partition coefficient n-octanol/water (log value): 2.471 @ 25°C
Vapour pressure: <0.01 kPa (<0.1 mm Hg) @ 20°C
Density and/or relative density: 1.036-1.040 (20 °C)
Relative vapour density: Not Available
Particle characteristics: Not Applicable
% Volatile by weight: 100%
VOC: Not Available

Amounts specified are typical and do not represent a specification.

9.2. Other information:

Information with regard to physical hazard classes:

Explosive properties: Not explosive
Oxidising properties: Not oxidizing

Other safety characteristics:

Evaporation rate: Not Available

SECTION 10: Stability and reactivity

10.1. Reactivity:

None known.

10.2. Chemical stability:

This product is stable. Readily undergoes oxidation by air.

10.3. Possibility of hazardous reactions:

Hazardous polymerization will not occur.

10.4. Conditions to avoid:

Excessive heat and ignition sources.

10.5. Incompatible materials:

Avoid strong bases and oxidizing agents.

10.6. Hazardous decomposition products:

Carbon dioxide and carbon monoxide.

SECTION 11: Toxicological information

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

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

<u>Chemical Name</u>	<u>Inhalation LC50</u>	<u>Species</u>	<u>Oral LD50</u>	<u>Species</u>	<u>Dermal LD50</u>	<u>Species</u>
2-Methyl-3-phenylacrylaldehyde (α-Methylcinnamaldehyde)	N/E	N/E	2050 mg/kg	Rat/ adult	>5000 mg/kg	Rabbit/ adult

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

<u>Chemical Name</u>	<u>Skin irritation</u>	<u>Species</u>
2-Methyl-3-phenylacrylaldehyde (α-Methylcinnamaldehyde)	Non-irritant	Human

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

<u>Chemical Name</u>	<u>Eye irritation</u>	<u>Species</u>
2-Methyl-3-phenylacrylaldehyde (α-Methylcinnamaldehyde)	Slight irritant	Rabbit/ adult

Respiratory or skin sensitization: Skin sensitization - Category 1.

<u>Chemical Name</u>	<u>Skin sensitisation</u>	<u>Species</u>
2-Methyl-3-phenylacrylaldehyde (α-Methylcinnamaldehyde)	Sensitizer	Weight of evidence

Carcinogenicity: Not classified (based on available data, the classification criteria are not met). READ-ACROSS (CINNAMALDEHYDE): In a 2-year animal feeding study, Cinnamaldehyde was not carcinogenic; NOAEL (carcinogenicity), rat: 400 mg/kg bw/day.

Germ cell mutagenicity: Not classified (based on available data, the classification criteria are not met). 2-METHYL-3-

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PHENYLACRYLALDEHYDE: Ames tests, with and without activation: negative. Mutagenicity was negative in in-vivo genotoxicity assays.

Reproductive toxicity: Not classified (based on available data, the classification criteria are not met). 2-METHYL-3-PHENYLACRYLALDEHYDE - READ-ACROSS/WEIGHT OF EVIDENCE: Reproductive toxicity, oral study in rats: NOEL (no-observed adverse-effect-level) of 200 mg/kg bw/day. Developmental toxicity, oral, rats: NOEL of 1200 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). 2-METHYL-3-PHENYLACRYLALDEHYDE: Repeated dose toxicity study: NOEL (No-Observed-Adverse-Effect-Level), oral, rat (weight of evidence) - 110 mg/kg bw/day; NOEL, dermal, rat (weight of evidence) - 110 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.

Information on likely routes of exposure:

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

Eyes: May cause eye irritation.

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

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

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

11.2. Information on other hazards

Endocrine disrupting properties: No specific information available.

Other information: No additional information available.

SECTION 12: Ecological information

12.1. Toxicity:

<u>Chemical Name</u>	<u>Species</u>	<u>Acute</u>	<u>Acute</u>	<u>Chronic</u>
2-Methyl-3-phenylacrylaldehyde (α-Methylcinnamaldehyde)	Fish	LC50 1.2 mg/L (96 hours) (similar materials)	N/E	N/E
2-Methyl-3-phenylacrylaldehyde (α-Methylcinnamaldehyde)	Invertebrates	EC50 9.9 mg/L (48 hours)	N/E	N/E
2-Methyl-3-phenylacrylaldehyde (α-Methylcinnamaldehyde)	Algae	EC50 14.8 mg/L (72 hours)	N/E	EC10 6.1 mg/L(72 hours)
2-Methyl-3-phenylacrylaldehyde (α-Methylcinnamaldehyde)	Micro-organisms	EC50 366 mg/L (3 hours)		

12.2. Persistence and degradability:

<u>Chemical Name</u>	<u>Biodegradation</u>
2-Methyl-3-phenylacrylaldehyde (α-Methylcinnamaldehyde)	Readily biodegradable (OECD 301B)

12.3. Bioaccumulative potential:

<u>Chemical Name</u>	<u>Bioconcentration Factor (BCF)</u>	<u>Log Kow</u>
2-Methyl-3-phenylacrylaldehyde (α-Methylcinnamaldehyde)	N/E	2.471 @ 25°C

12.4. Mobility in soil:

<u>Chemical Name</u>	<u>Mobility in soil (Koc/Kow)</u>
2-Methyl-3-phenylacrylaldehyde (α-Methylcinnamaldehyde)	N/E

12.5. Results of PBT and vPvB assessment:

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

12.6. Endocrine disrupting properties:

No specific information available.

12.7. 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 or ID 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: N/A

Canada TDG hazard class: N/A

Europe ADR/RID/ADN 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. Maritime transport in bulk according to IMO instruments

Not Applicable

SECTION 15: Regulatory information

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

Europe REACH (EC) 1907/2006: Applicable components are registered, exempt or otherwise compliant. For Europe REACH, CAS# 15174-47-7 (EC 701-219-0). REACH is only relevant to substances either manufactured or imported into the EU. Emerald Performance Materials has met its obligations under the REACH regulation. REACH information regarding this product is provided for informational purposes only. Each Legal Entity may have differing REACH obligations, depending on their place in the supply chain. For material manufactured outside of the EU, the importer of record must understand and meet their specific obligations under the regulation.

EU Authorizations and/or restrictions on use: Not Applicable

Other EU information: No Additional Information

National regulations: No Additional Information

Chemical inventories:

Regulation

Australian Inventory of Industrial Chemicals (AIIC):

Canadian Domestic Substances List (DSL):

Canadian Non-Domestic Substances List (NDSL):

China Inventory of Existing Chemical Substances (IECSC):

European EC Inventory (EINECS, ELINCS, NLP):

Japan Existing and New Chemical Substances (ENCS):

Japan Industrial Safety and Health Law (ISHL):

Korean Existing and Evaluated Chemical Substances (KECL):

New Zealand Inventory of Chemicals (NZIoC):

Philippines Inventory of Chemicals and Chemical Substances (PICCS):

Taiwan Inventory of Existing Chemicals:

Status

Y

Y

N

Y

Y

Y

Y

Y

Y

Y

Y

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Regulation

U.S. Toxic Substances Control Act (TSCA) (Active):

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.

Status

Y

15.2. Chemical safety assessment:

A chemical safety assessment has been carried out for the substance or mixture.

SECTION 16: Other information

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

H317 May cause an allergic skin reaction.

Reason for revision: Changes in Section(s): 1, 15, Safety data sheet format (Regulation (EU) 2020/878)

Evaluation method for classification of mixtures: Not Applicable (substance)

Legend:

- * : Trademark owned by Emerald Performance Materials, LLC.
- ACGIH: American Conference of Governmental Industrial Hygienists
- ATE: Acute toxicity estimate
- EU OELV: European Union Occupational Exposure Limit Value
- EU IOELV: European Union Indicative Occupational Exposure Limit Value
- N/A: Not Applicable
- N/E: None Established
- SCL: Specific concentration limit
- STEL: Short Term Exposure Limit
- TWA: Time Weighted Average (exposure for 8-hour workday)

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 Performance Materials, LLC
1499 SE Tech Center Place, Suite 300
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United States

Annex

Exposure Scenarios

Substance information:

Name of substance: (2E)-2-Methyl-3-phenylacrylaldehyde
EC# 701-219-0 / CAS# 15174-47-7
REACH Registration number: 01-2119538797-21-0000

List of exposure scenarios:

- ES1: Use at industrial sites - Use as an intermediate
- ES2: Formulation - Formulation of fragrance compounds
- ES3: Formulation - Formulation of fragranced end-products
- ES4: Use at industrial sites - Industrial end-use of washing and cleaning products
- ES5: Use by professional workers - Professional end-use of washing and cleaning products
- ES6: Consumer use - Consumer end-use of washing and cleaning products (Indoors)
- ES7: Consumer use - Consumer end-use of washing and cleaning products (Outdoors)
- ES8: Use by professional workers - Professional use of polishes and wax blends
- ES9: Consumer use - Consumer end-use of polishes and wax blends
- ES10: Consumer use - Consumer end-use of air care products
- ES11: Consumer use - Consumer end-use of biocides (Indoors)
- ES12: Consumer use - Consumer end-use of biocides (Outdoors)
- ES13: Use by professional workers - Professional end-use of cosmetics
- ES14: Consumer use - Consumer end-use of cosmetics

General remarks:

The first tier environmental exposure assessments have at first instance been performed using EUSES 2.1 which is part of Chemical Safety Assessment and Reporting tool version 2.2 (CHESAR v2.2). 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

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Assessment and Reporting tool version 2.2 (CHESAR v2.2).

The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated.

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

Exposure scenario (1): Use at industrial sites - Use as an intermediate

1. Exposure scenario (1)

Short title of the exposure scenario:

Use at industrial sites - Use as an intermediate

List of use descriptors:

Sector of use category (SU): SU8

Product category (PC): PC19

Process category (PROC): PROC1, PROC2, PROC3, PROC8b

Environmental release category (ERC): ERC6a (SpERC IFRA 2.1a.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.

PROC2 Chemical production or refinery in closed continuous process with occasional controlled 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.

PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities. Transfer includes loading, filling, dumping, bagging.

Name of contributing environmental scenario and corresponding ERCs:

ERC6a Use of intermediate.

Further explanations:

Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tableting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.

Industrial application.

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: Up to 100%.

Physical state: liquid.

Frequency and duration of use/exposure:

Duration:

- PROC1, PROC2, PROC3: <=8 hours/day.

- PROC8b: <=4 hours/day.

Human factors not influenced by risk management:

Exposed skin surface:

- PROC1, PROC3: 240 cm² (one hand, face side only).

- PROC2: 480 cm² (two hands, face side only).

- PROC8b: 960 cm² (two hands).

Other given operational conditions affecting workers exposure:

Location: Indoor use.

Domain: Industrial use.

Process temperature (for liquid): <= 40 °C.

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

General ventilation: 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.

- PROC3: Closed batch process with occasional controlled exposure.

- PROC8b: Semi-closed process with occasional controlled exposure.

Local exhaust ventilation: 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: Yes (chemically resistant gloves conforming to EN374 with specific activity training) (Effectiveness Dermal: 95%).

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply:

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.

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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.

On-site wastewater treatment required.

Product characteristics:

Physical state: liquid.

Vapour pressure: <0.5 kPa.

Amounts used:

Maximum daily use at a site: 24 ton/day.

Maximum annual use at a site: 7200 tons/year.

Percentage of tonnage used at regional scale: 100 %.

Frequency and duration of use:

Emission days: 300 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:

Industrial use.

Release fraction to air from process (initial release): 0.00025; (final release): 0.00025. Local release rate: 6 kg/day (SpERC IFRA 2.1a.v1).

Release fraction to wastewater from process (initial release): 0.00002; (final release): 0.000006. Local release rate: 0.144 kg/day (SpERC IFRA 2.1a.v1)

Release fraction to soil from process (final release): 0.0 (SpERC IFRA 2.1a.v1).

On-site treatment of wastewater: Physico-chemical treatment (Effectiveness Water: 70%).

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=87.61%).

Size of municipal sewage system/treatment plant: >=2000 m3/day (standard town).

Conditions and measures related to external treatment of waste for disposal:

External treatment and disposal of waste should comply with applicable local and/or national regulations.

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. Obligations according to Article 37(4) of REACH do not apply:

Spills are cleaned immediately.

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

3. Exposure estimation and reference to its source

Assessment method-Health: CHESAR V2.2 Worker TRA v3. Only highest figures are presented here.

Assessment method-Environment: CHESAR V2.2 - EUSES v2.1.

Health

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Worker, long-term, systemic, Dermal	0.686 mg/kg bw/day	0.31	PROC8b
Worker, long-term, systemic, Inhalation	5.482 mg/m3	0.412	PROC3, PROC8b
Worker, long-term, systemic, Combined routes	N/A	0.722	PROC8b
Worker, long-term, local, Dermal	0.05 mg/cm2	0.014	PROC8b
Worker, long-term, local, Inhalation	5.482 mg/m3	0.412	PROC3, PROC8b

Environment

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Freshwater	0.0009719 mg/L	0.81	
Freshwater sediment	0.023 mg/kg dw	0.572	
Marine water	0.00009676 mg/L	0.806	
Marine water sediment	0.002 mg/kg dw	0.57	
Soil	0.004 mg/kg dw	0.598	
STP	0.009 mg/L	<0.01	
Human via environment, Inhalation	0.001 mg/m3	<0.01	
Human via environment, Oral	0.0005801 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

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managed to at least equivalent levels. Duration: PROC1, PROC2, PROC3: <=8 hours/day. PROC8b: <=4 hours/day. Dermal protection: Yes (chemically resistant gloves conforming to EN374 with specific activity training) (Effectiveness Dermal: 95%). Concentration of substance: Up to 100%.

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 - Formulation of fragrance compounds

1. Exposure scenario (2)

Short title of the exposure scenario:

Formulation - Formulation of fragrance compounds

List of use descriptors:

Process category (PROC): PROC1, PROC3, PROC5, PROC8a, PROC8b, PROC9, PROC15

Environmental release category (ERC): ERC2 (SpERC IFRA 2.1a.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.

Further explanations:

Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tableting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.

Industrial application.

Generic exposure scenario: IFRA GES 1 (IU1).

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: 5-25%.

Physical state: liquid.

Frequency and duration of use/exposure:

Duration:

- PROC3, PROC5, PROC8a: <4 hours/day.

- PROC1, PROC8b, PROC9: <1 hour/day.

- PROC15: <15 minutes.

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 (for liquid): <= 40 °C.

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

General ventilation:

- PROC15: Good general ventilation (3-5 air changes per hour): 30%.

- PROC1, PROC3, PROC5, PROC8a, PROC8b, PROC9: 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.

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- PROC8b, PROC9: Semi-closed process with occasional controlled exposure.
 - PROC5, PROC8a, PROC15: No.
- Local exhaust ventilation: Not required.
Occupational Health and Safety Management System: Advanced.

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

Respiratory protection: Not required.

Dermal protection:

- PROC1, PROC3, PROC5, PROC8a, PROC8b, PROC9: Yes (chemically resistant gloves conforming to EN374 with specific activity training) (Effectiveness Dermal: 95%).
- PROC15: Yes (chemically resistant gloves conforming to EN374) (Effectiveness Dermal: 80%).

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply:

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.

On-site wastewater treatment required.

Product characteristics:

Physical state: liquid.

Vapour pressure: <0.5 kPa.

Amounts used:

Maximum daily use at a site: 2 ton/day.

Maximum annual use at a site: 300 tons/year.

Percentage of tonnage used at regional scale: 100 %.

Frequency and duration of use:

Emission days: 180 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:

Industrial use.

Release fraction to air from process (initial release): 0.00025; (final release): 0.00025. Local release rate: 0.5 kg/day (SpERC IFRA 2.1a.v1).

Release fraction to wastewater from process (initial release): 0.00002; (final release): 0.000006. Local release rate: 0.012 kg/day (SpERC IFRA 2.1a.v1)

Release fraction to soil from process (final release): 0.0 (SpERC IFRA 2.1a.v1).

On-site treatment of wastewater: Physico-chemical treatment (Effectiveness Water: 70%).

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=87.61%).

Size of municipal sewage system/treatment plant: >=2000 m3/day (standard town).

Conditions and measures related to external treatment of waste for disposal:

External treatment and disposal of waste should comply with applicable local and/or national regulations.

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. Obligations according to Article 37(4) of REACH do not apply:

Spills are cleaned immediately.

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

3. Exposure estimation and reference to its source

Assessment method-Health: CHESAR V2.2 Worker TRA v3. Only highest figures are presented here.

Assessment method-Environment: CHESAR V2.2 - EUSES v2.1.

Health

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Worker, long-term, systemic, Dermal	0.686 mg/kg bw/day	0.31	PROC5, PROC8b
Worker, long-term, systemic, Inhalation	6.578 mg/m3	0.495	PROC8a
Worker, long-term, systemic, Combined routes	N/A	0.722	
Worker, long-term, local, Dermal	0.1 mg/cm2	0.029	PROC5
Worker, long-term, local, Inhalation	6.578 mg/m3	0.495	PROC8a

Environment

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Freshwater	0.0001547 mg/L	0.129	

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Freshwater sediment	0.004 mg/kg dw	0.091	
Marine water	0.00001504 mg/L	0.125	
Marine water sediment	0.0003576 mg/kg dw	0.089	
Soil	0.0003591 mg/kg dw	0.051	
STP	0.0007432 mg/L	<0.01	
Human via environment, Inhalation	.00005921 mg/m3	<0.01	
Human via environment, Oral	0.00003069 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. Duration: PROC3, PROC5, PROC8a: <4 hours/day. PROC1, PROC8b, PROC9: <1 hour/day. PROC15: <15 minutes. Dermal protection: PROC1, PROC3, PROC5, PROC8a, PROC8b, PROC9: Yes (chemically resistant gloves conforming to EN374 with specific activity training) (Effectiveness Dermal: 95%). PROC15: Yes (chemically resistant gloves conforming to EN374) (Effectiveness Dermal: 80%). Concentration of substance: Up to 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 (3): Formulation - Formulation of fragranced end-products

1. Exposure scenario (3)

Short title of the exposure scenario:

Formulation - Formulation of fragranced end-products

List of use descriptors:

Process category (PROC): PROC1, PROC3, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15

Environmental release category (ERC): ERC2 (SpERC AISE 2.1g.v2).

List of names of contributing worker scenarios and corresponding PROCs:

PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.

PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition.

PROC5 Mixing or blending in batch processes. Covers mixing or blending of solid or liquid materials in the context of manufacturing or formulating sectors, as well as upon end use.

PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities. Transfer includes loading, filling, dumping, bagging and weighing.

PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities. Transfer includes loading, filling, dumping, bagging.

PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing). Filling lines specifically designed to both capture vapour and aerosol emissions and minimise spillage.

PROC14 Tableting, 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 in laboratories (less than or equal to 1 l or 1 kg present at workplace).

Name of contributing environmental scenario and corresponding ERCs:

ERC2 Formulation into mixture.

Further explanations:

Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tableting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.

Industrial application.

Generic exposure scenario: IFRA GES 2 (IU2).

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: 5-25%.

- PROC8a, PROC9, PROC14: <1%.

Physical state: liquid.

Frequency and duration of use/exposure:

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Duration:

- PROC14: <=8 hours/day.
- PROC3, PROC5, PROC8a: <=4 hours/day.
- PROC1, PROC8b, PROC9: <=1 hour/day.
- PROC15: <=15 minutes.

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 (for liquid): <= 40 °C.

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

General ventilation:

- PROC15: Good general ventilation (3-5 air changes per hour): 30%.
- PROC1, PROC3, PROC5, PROC8a, PROC8b, PROC9, PROC14: 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: Not required.

Occupational Health and Safety Management System: Advanced.

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

Respiratory protection: Not required.

Dermal protection:

- PROC1, PROC3, PROC8a, PROC9, PROC14, PROC15: No (Effectiveness Dermal: 0%).
- PROC5: Yes (chemically resistant gloves conforming to EN374 with basic employee training) (Effectiveness Dermal: 90%).
- PROC8b: Yes (chemically resistant gloves conforming to EN374) (Effectiveness Dermal: 80%).

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply:

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: <0.5 kPa.

Amounts used:

Maximum daily use at a site: 1.5 ton/day.

Maximum annual use at a site: 15 tons/year.

Percentage of tonnage used at regional scale: 10 %.

Frequency and duration of use:

Emission days: 220 days/year.

Environmental factors not influenced by risk management:

Flow rate of receiving surface water: >=18,000 m³/day (default).

Other given operational conditions affecting environmental exposure:

Indoor use.

Industrial use.

Release fraction to air from process (initial release): 0.0; (final release): 0.0. Local release rate: 0 kg/day (SpERC AISE 2.1g.v2).

Release fraction to wastewater from process (initial release): 0.0001; (final release): 0.0001. Local release rate: 0.15 kg/day (SpERC AISE 2.1g.v2)

Release fraction to soil from process (final release): 0.0 (SpERC AISE 2.1g.v2).

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Dry sludge application to agricultural soil: Yes (default).

Process efficiency: Process optimized for highly efficient use of raw materials (very minimal environmental release).

Equipment cleaning: Equipment cleaning with minimized emissions to wastewater.

Conditions and measures related to municipal sewage treatment plant:

Municipal Sewage Treatment Plant (STP): Yes (Efficiency=87.61%).

Size of municipal sewage system/treatment plant: >=2000 m³/day (standard town).

Conditions and measures related to external treatment of waste for disposal:

External treatment and disposal of waste should comply with applicable local and/or national regulations.

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. Obligations according to Article 37(4) of REACH do not apply:

Spills are cleaned immediately.

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 V2.2 - EUSES v2.1.

Health

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Worker, long-term, systemic, Dermal	1.645 mg/kg bw/day	0.744	PROC8b
Worker, long-term, systemic, Inhalation	3.289 mg/m3	0.247	PROC5
Worker, long-term, systemic, Combined routes	N/A	0.827	PROC8b
Worker, long-term, local, Dermal	0.12 mg/cm2	0.034	PROC3, PROC5, PROC8b
Worker, long-term, local, Inhalation	3.289 mg/m3	0.247	PROC5

Environment

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Freshwater	0.001 mg/L	0.841	
Freshwater sediment	0.024 mg/kg dw	0.594	
Marine water	0.0001005 mg/L	0.837	
Marine water sediment	0.002 mg/kg dw	0.591	
Soil	0.004 mg/kg dw	0.584	
STP	0.009 mg/L	<0.01	
Human via environment, Inhalation	0.000002091 mg/m3	<0.01	
Human via environment, Oral	0.00002135 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. Duration: PROC14: <=8 hours/day. PROC3, PROC5, PROC8a: <=4 hours/day. PROC1, PROC8b, PROC9: <=1 hour/day. PROC15: <=15 minutes. Dermal protection: PROC1, PROC3, PROC8a, PROC9, PROC14: No (Effectiveness Dermal: 0%). PROC5: Yes (chemically resistant gloves conforming to EN374 with basic employee training) (Effectiveness Dermal: 90%). PROC8b: Yes (chemically resistant gloves conforming to EN374) (Effectiveness Dermal: 80%). Concentration of substance: PROC1, PROC3, PROC5, PROC8b, PROC15: 5-25%. 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 (4): Use at industrial sites - Industrial end-use of washing and cleaning products**1. Exposure scenario (4)****Short title of the exposure scenario:**

Use at industrial sites - Industrial end-use of washing and cleaning products

List of use descriptors:

Sector of use category (SU): SU0

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:

Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tableting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory

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activities.

Industrial application.

Generic exposure scenario: IFRA GES 3 (IU3).

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

2. Conditions of use affecting exposure

2.1 Control of workers exposure

General:

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

Product characteristics:

Concentration of substance: Up to 1%.

Physical state: liquid.

Frequency and duration of use/exposure:

Duration:

- PROC1, PROC2, PROC4, PROC7, PROC8b, PROC10: <=8 hours/day.

- PROC13: <=4 hours/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, PROC7, PROC13: Indoor use.

- PROC4, PROC8b, PROC10: Outdoor use.

Domain: Industrial use.

Process temperature (for liquid): <= 40 °C.

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

General ventilation: Basic general ventilation (1-3 air changes per hour): 0%.

Containment:

- PROC1: Closed system (minimal contact during routine operations).

- PROC2: Closed continuous process with occasional controlled exposure.

- PROC4, PROC8b: Semi-closed process with occasional controlled exposure.

- PROC7, PROC10, PROC13: No.

Local exhaust ventilation:

- PROC1, PROC2, PROC4, PROC8b, PROC13: Not required.

- PROC7: Yes (95% effectiveness).

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, PROC2, PROC4, PROC8b, PROC13: No (Effectiveness Dermal: 0%).

- PROC7, PROC10: Yes (chemically resistant gloves conforming to EN374) (Effectiveness Dermal: 80%).

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply:

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: <0.5 kPa.

Amounts used:

Maximum daily use at a site: 0.0000275 ton/day.

Maximum annual use at a site: 0.5 tons/year.

Percentage of tonnage used at regional scale: 10 %.

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:

Industrial use.

Indoor use.

Release fraction to air from process (initial release): 1.00; (final release): 1.00. Local release rate: 0.027 kg/day.

Release fraction to wastewater from process (initial release): 1.00; (final release): 1.00. Local release rate: 0.027 kg/day.

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Release fraction to soil from process (final release): 0,05.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Dry sludge application to agricultural soil: Yes (default).

Conditions and measures related to municipal sewage treatment plant:

Municipal Sewage Treatment Plant (STP): Yes (Efficiency=87.61%).

Size of municipal sewage system/treatment plant: >=2000 m3/day (standard town).

Conditions and measures related to external treatment of waste for disposal:

External treatment and disposal of waste should comply with applicable local and/or national regulations.

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. Obligations according to Article 37(4) of REACH do not apply:

Spills are cleaned immediately.

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

3. Exposure estimation and reference to its source

Assessment method-Health: CHESAR V2.2 Worker TRA v3. Only highest figures are presented here.

Assessment method-Environment: CHESAR V2.2 - EUSES v2.1.

Health

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Worker, long-term, systemic, Dermal	1.371 mg/kg bw/day	0.62	PROC8b, PROC13
Worker, long-term, systemic, Inhalation	4.264 mg/m3	0.321	PROC10
Worker, long-term, systemic, Combined routes	N/A	0.895	PROC13
Worker, long-term, local, Dermal	0.2 mg/cm2	0.057	PROC13
Worker, long-term, local, Inhalation	4.264 mg/m3	0.321	PROC10

Environment

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Freshwater	0.0002506 mg/L	0.209	
Freshwater sediment	0.006 mg/kg dw	0.148	
Marine water	0.00002464 mg/L	0.205	
Marine water sediment	0.0005858 mg/kg dw	0.145	
Soil	0.0008481 mg/kg dw	0.12	
STP	0.002 mg/L	<0.01	
Human via environment, Inhalation	0.0003829 mg/m3	<0.01	
Human via environment, Oral	0.0007436 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. Duration: PROC1, PROC2, PROC4, PROC7, PROC8b, PROC10: <=8 hours/day. PROC13: <=4 hours/day. Dermal protection: PROC1, PROC2, PROC4, PROC8b, PROC13: No (Effectiveness Dermal: 0%). PROC7, PROC10: Yes (chemically resistant gloves conforming to EN374) (Effectiveness Dermal: 80%). Local exhaust ventilation: PROC1, PROC2, PROC4, PROC8b, PROC13: Not required. PROC7: Yes (95% effectiveness).

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 - Professional end-use of washing and cleaning products

1. Exposure scenario (5)

Short title of the exposure scenario:

Use by professional workers - Professional end-use of washing and cleaning products

List of use descriptors:

Sector of use category (SU): SU0

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,

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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:

Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tableting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.

Professional application.

Generic exposure scenario: IFRA GES 4 (IU4).

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

2. Conditions of use affecting exposure

2.1 Control of workers exposure

General:

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

Product characteristics:

Concentration of substance: Up to 1%.

Physical state: liquid.

Frequency and duration of use/exposure:

Duration:

- PROC1, PROC2, PROC4, PROC8b: <=8 hours/day.

- PROC8a, PROC10, PROC13: <=4 hours/day.

- PROC11: <=1 hour/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 (for liquid): <= 40 °C.

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

General ventilation:

- PROC1, PROC2, PROC4, PROC10, PROC11, PROC13: Basic general ventilation (1-3 air changes per hour): 0%.

- PROC8b: Good general ventilation (3-5 air changes per hour): 30%.

- PROC8a: 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.

Occupational Health and Safety Management System: Basic.

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

Respiratory protection:

- PROC1, PROC2, PROC4, PROC8a, PROC8b, PROC10, PROC13: Not required.

- PROC11: Yes (Respirator with APF of 10) (Effectiveness Inhalation: 90%).

Dermal protection:

- PROC1, PROC2, PROC4, PROC8a, PROC8b, PROC13: No (Effectiveness Dermal: 0%).

- PROC10: Yes (chemically resistant gloves conforming to EN374) (Effectiveness Dermal: 80%).

- PROC11: Yes (chemically resistant gloves conforming to EN374 with basic employee training) (Effectiveness Dermal: 90%).

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply:

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:

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

Product characteristics:

Physical state: liquid.
Vapour pressure: <0.5 kPa.

Amounts used:

Daily wide dispersive use: 0.0000275 tons/day.
Percentage of tonnage used at regional scale: 10 %.

Frequency and duration of use:

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:

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: 0.027 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=87.61%).
Size of municipal sewage system/treatment plant: >=2000 m3/day (standard town).

Conditions and measures related to external treatment of waste for disposal:

External treatment and disposal of waste should comply with applicable local and/or national regulations.
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. Obligations according to Article 37(4) of REACH do not apply:

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

3. Exposure estimation and reference to its source

Assessment method-Health: CHESAR V2.2 Worker TRA v3. Only highest figures are presented here.

Assessment method-Environment: CHESAR V2.2 - EUSES v2.1.

Health

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Worker, long-term, systemic, Dermal	1.371 mg/kg bw/day	0.62	PROC8a, PROC8b, PROC13
Worker, long-term, systemic, Inhalation	9.137 mg/m3	0.687	PROC10
Worker, long-term, systemic, Combined routes	N/A	0.943	PROC11
Worker, long-term, local, Dermal	0.2 mg/cm2	0.057	PROC13
Worker, long-term, local, Inhalation	9.137 mg/m3	0.687	PROC10

Environment

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Freshwater	0.0002506 mg/L	0.209	
Freshwater sediment	0.006 mg/kg dw	0.148	
Marine water	0.00002464 mg/L	0.205	
Marine water sediment	0.0005858 mg/kg dw	0.145	
Soil	0.0007749 mg/kg dw	0.109	
STP	0.002 mg/L	<0.01	
Human via environment, Inhalation	0.000002104 mg/m3	<0.01	
Human via environment, Oral	0.00001971 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. Duration: PROC1, PROC2, PROC4, PROC8b: <=8 hours/day. PROC8a, PROC10, PROC13: <=4 hours/day. PROC11: <=1 hour/day. Dermal protection: PROC1, PROC2, PROC4, PROC8a, PROC8b, PROC13: No (Effectiveness Dermal: 0%). PROC10: Yes (chemically resistant gloves conforming to EN374) (Effectiveness Dermal: 80%). PROC11: Yes (chemically resistant gloves conforming to EN374 with basic employee training) (Effectiveness Dermal: 90%). Respiratory protection: PROC1, PROC2, PROC4, PROC8a, PROC8b, PROC10, PROC13: Not required. PROC11: Yes (Respirator with APF of 10) (Effectiveness Inhalation: 90%). 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

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chemical safety assessment is required.

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

1. Exposure scenario (6)

Short title of the exposure scenario:

Consumer use - Consumer end-use of washing and cleaning products (Indoors)

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:

Consumer uses e.g. as a carrier in cosmetics/personal care products, perfumes and fragrances. Note: For cosmetic and personal care products, risk assessment only required for the environment under REACH as human health is covered by alternative legislation.

Consumer application.

Generic exposure scenario: IFRA GES 6 (IU6).

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

2. Conditions of use affecting exposure

2.1 Control of consumer exposure

General:

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

Product characteristics:

Concentration of substance in mixture: Up to 0.001 g/g.

Physical state: liquid.

Amounts used:

Applied amounts for each use event: 50 g.

Frequency and duration of use/exposure:

Duration covers exposure up to: 60 minutes/event.

Frequency - covers use frequency: up to 1 time/day; 365 times/year.

Human factors not influenced by risk management:

Exposed skin surface: Hands.

Dermal transfer factor=1.

2.2 Control of environmental exposure

Product characteristics:

Physical state: liquid.

Vapour pressure: <0.5 kPa.

Amounts used:

Daily wide dispersive use: 0.00002475 tons/day.

Percentage of tonnage used at regional scale: 10 %.

Frequency and duration of use:

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.

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: 0.025 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=87.61%).

Size of municipal sewage system/treatment plant: >=2000 m3/day (standard town).

Conditions and measures related to external treatment of waste for disposal:

External treatment and disposal of waste should comply with applicable local and/or national regulations.

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. Obligations according to Article 37(4) of REACH do not apply:

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

3. Exposure estimation and reference to its source

Assessment method-Health: CHESAR V2.2 Consumer TRA v3.

Assessment method-Environment: CHESAR V2.2 - EUSES v2.1.

Health

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
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Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Consumer, long-term, systemic, Dermal	0.143 mg/kg bw/day	0.129	
Consumer, long-term, systemic, Inhalation	0.156 mg/m ³	0.048	
Consumer, long-term, systemic, Oral	0 mg/kg bw/day	<0.01	
Consumer, long-term, systemic, Combined routes	N/A	0.177	
Consumer, long-term, local, Inhalation	0.156 mg/m ³	0.048	

Environment

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Freshwater	0.0002336 mg/L	0.195	
Freshwater sediment	0.006 mg/kg dw	0.138	
Marine water	0.00002293 mg/L	0.191	
Marine water sediment	0.0005453 mg/kg dw	0.135	
Soil	0.0006992 mg/kg dw	0.098	
STP	0.002 mg/L	<0.01	
Human via environment, Inhalation	0.000002102 mg/m ³	<0.01	
Human via environment, Oral	0.00001839 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 - Consumer end-use of washing and cleaning products (Outdoors)**1. Exposure scenario (7)****Short title of the exposure scenario:**

Consumer use - Consumer end-use of washing and cleaning products (Outdoors)

List of use descriptors:

Product category (PC): PC35

Environmental release category (ERC): ERC8a, ERC8d

Name of contributing environmental scenario and corresponding ERCs:

ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor).

ERC8d Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor).

Further explanations:

Consumer uses e.g. as a carrier in cosmetics/personal care products, perfumes and fragrances. Note: For cosmetic and personal care products, risk assessment only required for the environment under REACH as human health is covered by alternative legislation.

Consumer application.

Generic exposure scenario: IFRA GES 6 (IU6).

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

2. Conditions of use affecting exposure**2.1 Control of consumer exposure****General:**

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

Product characteristics:

Concentration of substance in mixture: Up to 0.001 g/g.

Physical state: liquid.

Amounts used:

Applied amounts for each use event: 50 g.

Frequency and duration of use/exposure:

Duration covers exposure up to: 60 minutes/event.

Frequency - covers use frequency: up to 1 time/day; 365 times/year.

Human factors not influenced by risk management:

Exposed skin surface: Hands.

Dermal transfer factor=1.

2.2 Control of environmental exposure**Product characteristics:**

Physical state: liquid.

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Vapour pressure: <0.5 kPa.

Amounts used:

Daily wide dispersive use: 0,00000275 tons/day.

Percentage of tonnage used at regional scale: 10 %.

Frequency and duration of use:

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:

Outdoor 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: 0.003 kg/day.

Release fraction to soil from process (final release): 0.20.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Dry sludge application to agricultural soil: Yes (default).

Conditions and measures related to municipal sewage treatment plant:

Municipal Sewage Treatment Plant (STP): Yes (Efficiency=87.61%).

Size of municipal sewage system/treatment plant: >=2000 m3/day (standard town).

Conditions and measures related to external treatment of waste for disposal:

External treatment and disposal of waste should comply with applicable local and/or national regulations.

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. Obligations according to Article 37(4) of REACH do not apply:

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

3. Exposure estimation and reference to its source

Assessment method-Health: CHESAR V2.2 Consumer TRA v3.

Assessment method-Environment: CHESAR V2.2 - EUSES v2.1.

Health

<u>Effect/Compartment</u>	<u>Exposure estimate/PEC</u>	<u>RCR</u>	<u>Notes</u>
Consumer, long-term, systemic, Dermal	0.143 mg/kg bw/day	0.129	
Consumer, long-term, systemic, Inhalation	0.156 mg/m3	0.048	
Consumer, long-term, systemic, Oral	0 mg/kg bw/day	<0.01	
Consumer, long-term, systemic, Combined routes	N/A	0.177	
Consumer, long-term, local, Inhalation	0.156 mg/m3	0.048	

Environment

<u>Effect/Compartment</u>	<u>Exposure estimate/PEC</u>	<u>RCR</u>	<u>Notes</u>
Freshwater	0.00009742 mg/L	0.081	
Freshwater sediment	0.002 mg/kg dw	0.057	
Marine water	0.000009314 mg/L	0.078	
Marine water sediment	0.0002215 mg/kg dw	0.055	
Soil	0.00009345 mg/kg dw	0.013	
STP	0.0001703 mg/L	<0.01	
Human via environment, Inhalation	0.000002091 mg/m3	<0.01	
Human via environment, Oral	0.00000782 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): Use by professional workers - Professional use of polishes and wax blends

1. Exposure scenario (8)

Short title of the exposure scenario:

Use by professional workers - Professional use of polishes and wax blends

List of use descriptors:

Sector of use category (SU): SU0

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Product category (PC): PC31

Process category (PROC): PROC2, PROC8a, 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.

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.

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:

Generic exposure scenario: IFRA GES 5 (IU5).

Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tableting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.

Professional application.

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

2. Conditions of use affecting exposure

2.1 Control of workers exposure

General:

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

Product characteristics:

Concentration of substance: Up to 1%.

Physical state: liquid.

Frequency and duration of use/exposure:

Duration:

- PROC2, PROC8b: <=8 hours/day.

- PROC8a, PROC10: <=4 hours/day.

- PROC11: <=1 hour/day.

Human factors not influenced by risk management:

Exposed skin surface:

- PROC2: 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 (for liquid): <= 40 °C.

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

General ventilation:

- PROC2, PROC10: Basic general ventilation (1-3 air changes per hour): 0%.

- PROC8b: Good general ventilation (3-5 air changes per hour): 30%.

- PROC8a, 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.

- PROC8a, PROC10, PROC11: No.

Local exhaust ventilation: Not required.

Occupational Health and Safety Management System: Basic.

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

Respiratory protection: Not required.

Dermal protection:

- PROC2, PROC8a, PROC8b: No (Effectiveness Dermal: 0%).

- PROC10: Yes (chemically resistant gloves conforming to EN374) (Effectiveness Dermal: 80%).

- PROC11: Yes (chemically resistant gloves conforming to EN374 with basic employee training) (Effectiveness Dermal: 90%).

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply:

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: <0.5 kPa.

Amounts used:

Daily wide dispersive use: 0.000006875 tons/day.

Percentage of tonnage used at regional scale: 10 %.

Frequency and duration of use:

Wide dispersive use.

Environmental factors not influenced by risk management:

Flow rate of receiving surface water: >=18000 m3/day (default).

Other given operational conditions affecting environmental exposure:

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: 0.007 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=87.61%).

Size of municipal sewage system/treatment plant: >=2000 m3/day (standard town).

Conditions and measures related to external treatment of waste for disposal:

External treatment and disposal of waste should comply with applicable local and/or national regulations.

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. Obligations according to Article 37(4) of REACH do not apply:

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

3. Exposure estimation and reference to its source

Assessment method-Health: CHESAR V2.2 Worker TRA v3. Only highest figures are presented here.

Assessment method-Environment: CHESAR V2.2 - EUSES v2.1.

Health

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Worker, long-term, systemic, Dermal	1.371 mg/kg bw/day	0.62	PROC8a, PROC8b
Worker, long-term, systemic, Inhalation	9.137 mg/m3	0.687	PROC10
Worker, long-term, systemic, Combined routes	N/A	0.941	PROC8b
Worker, long-term, local, Dermal	0.1 mg/cm2	0.029	PROC8a, PROC8b
Worker, long-term, local, Inhalation	9.137 mg/m3	0.687	PROC10

Environment

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Freshwater	0.000123 mg/L	0.103	
Freshwater sediment	0.003 mg/kg dw	0.072	
Marine water	0.00001187 mg/L	0.099	
Marine water sediment	0.0002822 mg/kg dw	0.07	
Soil	0.000207 mg/kg dw	0.029	
STP	0.0004258 mg/L	<0.01	
Human via environment, Inhalation	0.000002093 mg/m3	<0.01	
Human via environment, Oral	0.000009802 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. Duration: PROC2, PROC8b: <=8 hours/day. PROC8a, PROC10: <=4 hours/day. PROC11: <=1 hour/day. Dermal protection: PROC2, PROC8a, PROC8b: No (Effectiveness Dermal: 0%). PROC10: Yes (chemically resistant gloves conforming to EN374) (Effectiveness Dermal: 80%). PROC11: Yes (chemically resistant gloves conforming to EN374 with basic employee training) (Effectiveness Dermal: 90%). 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

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chemical safety assessment is required.

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

1. Exposure scenario (9)

Short title of the exposure scenario:

Consumer use - 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:

Consumer uses e.g. as a carrier in cosmetics/personal care products, perfumes and fragrances. Note: For cosmetic and personal care products, risk assessment only required for the environment under REACH as human health is covered by alternative legislation.

Consumer application.

Generic exposure scenario: IFRA GES 9 (IU9).

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

2. Conditions of use affecting exposure

2.1 Control of consumer exposure

General:

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

Product characteristics:

Concentration of substance in mixture: Up to 0.001 g/g.

Physical state: liquid.

Amounts used:

Applied amounts for each use event: 550 g.

Frequency and duration of use/exposure:

Duration covers exposure up to: 4 hours/event.

Frequency - covers use frequency: up to 1 time/day; 365 times/year.

Human factors not influenced by risk management:

Exposed skin surface: Hands.

Dermal transfer factor=1.

2.2 Control of environmental exposure

Product characteristics:

Physical state: liquid.

Vapour pressure: <0.5 kPa.

Amounts used:

Daily wide dispersive use: 0.000006875 tons/day.

Percentage of tonnage used at regional scale: 10 %.

Frequency and duration of use:

Wide dispersive use.

Environmental factors not influenced by risk management:

Flow rate of receiving surface water: >=18000 m3/day (default).

Other given operational conditions affecting environmental exposure:

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: 0.007 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=87.61%).

Size of municipal sewage system/treatment plant: >=2000 m3/day (standard town).

Conditions and measures related to external treatment of waste for disposal:

External treatment and disposal of waste should comply with applicable local and/or national regulations.

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. Obligations according to Article 37(4) of REACH do not apply:

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

3. Exposure estimation and reference to its source

Assessment method-Health: CHESAR V2.2 Consumer TRA v3.

Assessment method-Environment: CHESAR V2.2 - EUSES v2.1.

Health

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Consumer, long-term, systemic, Dermal	0.143 mg/kg bw/day	0.129	

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Consumer, long-term, systemic, Inhalation	0.809 mg/m ³	0.247	
Consumer, long-term, systemic, Oral	0 mg/kg bw/day	<0.01	
Consumer, long-term, systemic, Combined routes	N/A	0.376	
Consumer, long-term, local, Inhalation	0.809 mg/m ³	0.247	

Environment

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Freshwater	0.000123 mg/L	0.103	
Freshwater sediment	0.003 mg/kg dw	0.072	
Marine water	0.00001187 mg/L	0.099	
Marine water sediment	0.0002822 mg/kg dw	0.07	
Soil	0.000207 mg/kg dw	0.029	
STP	0.0004258 mg/L	<0.01	
Human via environment, Inhalation	0.000002093 mg/m ³	<0.01	
Human via environment, Oral	0.000009802 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 - Consumer end-use of air care products**1. Exposure scenario (10)****Short title of the exposure scenario:**

Consumer use - 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:

Generic exposure scenario: IFRA GES 7 (IU7).

Consumer uses e.g. as a carrier in cosmetics/personal care products, perfumes and fragrances. Note: For cosmetic and personal care products, risk assessment only required for the environment under REACH as human health is covered by alternative legislation.

Consumer application.

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

2. Conditions of use affecting exposure**2.1 Control of consumer exposure****General:**

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

Product characteristics:

Concentration of substance in mixture:

- Air care products (aerosol): Up to 0.002 g/g.

- Air care products, continuous action (solid and liquid): Up to 0.05 g/g.

Physical state: liquid.

Amounts used:

Applied amounts for each use event: 50 g.

Frequency and duration of use/exposure:

Duration covers exposure up to: 8 hours/event.

Frequency - covers use frequency: up to 1 time/day; 365 times/year.

2.2 Control of environmental exposure**Product characteristics:**

Physical state: liquid.

Vapour pressure: <0.5 kPa.

Amounts used:

Daily wide dispersive use: 0.000066 tons/day.

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Percentage of tonnage used at regional scale: 10 %.

Frequency and duration of use:

Wide dispersive use.

Environmental factors not influenced by risk management:

Flow rate of receiving surface water: >=18000 m3/day (default).

Other given operational conditions affecting environmental exposure:

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: 0.066 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=87.61%).

Size of municipal sewage system/treatment plant: >=2000 m3/day (standard town).

Conditions and measures related to external treatment of waste for disposal:

External treatment and disposal of waste should comply with applicable local and/or national regulations.

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. Obligations according to Article 37(4) of REACH do not apply:

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

3. Exposure estimation and reference to its source

Assessment method-Health: CHESAR V2.2 Consumer TRA v3.

Assessment method-Environment: CHESAR V2.2 - EUSES v2.1.

Health

<u>Effect/Compartment</u>	<u>Exposure estimate/PEC</u>	<u>RCR</u>	<u>Notes</u>
Consumer, long-term, systemic, Dermal	0 mg/kg bw/day	<0.01	
Consumer, long-term, systemic, Inhalation	2.155 mg/m3	0.659	
Consumer, long-term, systemic, Oral	0 mg/kg bw/day	<0.01	
Consumer, long-term, systemic, Combined routes	N/A	0.659	
Consumer, long-term, local, Inhalation	2.155 mg/m3	0.659	

Environment

<u>Effect/Compartment</u>	<u>Exposure estimate/PEC</u>	<u>RCR</u>	<u>Notes</u>
Freshwater	0.000489 mg/L	0.408	
Freshwater sediment	0.012 mg/kg dw	0.288	
Marine water	0.00004847 mg/L	0.404	
Marine water sediment	0.001 mg/kg dw	0.285	
Soil	0.002 mg/kg dw	0.258	
STP	0.004 mg/L	<0.01	
Human via environment, Inhalation	0.000002123 mg/m3	<0.01	
Human via environment, Oral	0.00003821 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 (11): Consumer use - Consumer end-use of biocides (Indoors)

1. Exposure scenario (11)

Short title of the exposure scenario:

Consumer use - Consumer end-use of biocides (Indoors)

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:

SDS Name: Kalama* Cyprinal

Generic exposure scenario: IFRA GES 8 (IU8).

Consumer uses e.g. as a carrier in cosmetics/personal care products, perfumes and fragrances. Note: For cosmetic and personal care products, risk assessment only required for the environment under REACH as human health is covered by alternative legislation.

Consumer application.

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

2. Conditions of use affecting exposure

2.1 Control of consumer exposure

General:

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

2.2 Control of environmental exposure

Product characteristics:

Physical state: liquid.

Vapour pressure: <0.5 kPa.

Amounts used:

Daily wide dispersive use: 0,00000275 tons/day.

Percentage of tonnage used at regional scale: 10 %.

Frequency and duration of use:

Wide dispersive use.

Environmental factors not influenced by risk management:

Flow rate of receiving surface water: >=18000 m3/day (default).

Other given operational conditions affecting environmental exposure:

Indoor 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: 0.003 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=87.61%).

Size of municipal sewage system/treatment plant: >=2000 m3/day (standard town).

Conditions and measures related to external treatment of waste for disposal:

External treatment and disposal of waste should comply with applicable local and/or national regulations.

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. Obligations according to Article 37(4) of REACH do not apply:

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 V2.2 - EUSES v2.1.

Environment

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Freshwater	0.00009742 mg/L	0.081	
Freshwater sediment	0.002 mg/kg dw	0.057	
Marine water	0.000009314 mg/L	0.078	
Marine water sediment	0.0002215 mg/kg dw	0.055	
Soil	0.00009345 mg/kg dw	0.013	
STP	0.0001703 mg/L	<0.01	
Human via environment, Inhalation	0.000002091 mg/m3	<0.01	
Human via environment, Oral	0.00000782 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

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 (12): Consumer use - Consumer end-use of biocides (Outdoors)

1. Exposure scenario (12)

Short title of the exposure scenario:

Consumer use - Consumer end-use of biocides (Outdoors)

List of use descriptors:

SDS Name: Kalama* Cyprinal

Product category (PC): PC8

Environmental release category (ERC): ERC8a, ERC8d

Name of contributing environmental scenario and corresponding ERCs:

ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor).

ERC8d Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor).

Further explanations:

Consumer uses e.g. as a carrier in cosmetics/personal care products, perfumes and fragrances. Note: For cosmetic and personal care products, risk assessment only required for the environment under REACH as human health is covered by alternative legislation.

Consumer application.

Generic exposure scenario: IFRA GES 8 (IU8).

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

2. Conditions of use affecting exposure

2.1 Control of consumer exposure

General:

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

2.2 Control of environmental exposure

Product characteristics:

Physical state: liquid.

Vapour pressure: <0.5 kPa.

Amounts used:

Daily wide dispersive use: 0,00000275 tons/day.

Percentage of tonnage used at regional scale: 10 %.

Frequency and duration of use:

Wide dispersive use.

Environmental factors not influenced by risk management:

Flow rate of receiving surface water: >=18000 m3/day (default).

Other given operational conditions affecting environmental exposure:

Outdoor 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: 0.003 kg/day.

Release fraction to soil from process (final release): 0.20.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Dry sludge application to agricultural soil: Yes (default).

Conditions and measures related to municipal sewage treatment plant:

Municipal Sewage Treatment Plant (STP): Yes (Efficiency=87.61%).

Size of municipal sewage system/treatment plant: >=2000 m3/day (standard town).

Conditions and measures related to external treatment of waste for disposal:

External treatment and disposal of waste should comply with applicable local and/or national regulations.

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. Obligations according to Article 37(4) of REACH do not apply:

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 V2.2 - EUSES v2.1.

Environment

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Freshwater	0.00009742 mg/L	0.081	
Freshwater sediment	0.002 mg/kg dw	0.057	
Marine water	0.000009314 mg/L	0.078	
Marine water sediment	0.0002215 mg/kg dw	0.055	
Soil	0.00009345 mg/kg dw	0.013	
STP	0.0001703 mg/L	<0.01	
Human via environment, Inhalation	0.000002091 mg/m3	<0.01	
Human via environment, Oral	0.00000782 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

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

SDS Name: Kalama* Cyprinal

chemical safety assessment is required.

Exposure scenario (13): Use by professional workers - Professional end-use of cosmetics

1. Exposure scenario (13)

Short title of the exposure scenario:

Use by professional workers - Professional 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:

Generic exposure scenario: IFRA GES 10 (IU10).

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

Professional application.

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

2. Conditions of use affecting exposure

2.1 Control of workers exposure

General:

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: <0.5 kPa.

Amounts used:

Daily wide dispersive use: 0.000006875 tons/day.

Percentage of tonnage used at regional scale: 10 %.

Frequency and duration of use:

Wide dispersive use.

Environmental factors not influenced by risk management:

Flow rate of receiving surface water: >=18000 m3/day (default).

Other given operational conditions affecting environmental exposure:

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: 0.007 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=87.61%).

Size of municipal sewage system/treatment plant: >=2000 m3/day (standard town).

Conditions and measures related to external treatment of waste for disposal:

External treatment and disposal of waste should comply with applicable local and/or national regulations.

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. Obligations according to Article 37(4) of REACH do not apply:

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 V2.2 - EUSES v2.1.

Environment

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Freshwater	0.000123 mg/L	0.103	
Freshwater sediment	0.003 mg/kg dw	0.072	
Marine water	0.00001187 mg/L	0.099	
Marine water sediment	0.0002822 mg/kg dw	0.07	
Soil	0.000207 mg/kg dw	0.029	
STP	0.0004258 mg/L	<0.01	
Human via environment, Inhalation	0.000002093 mg/m3	<0.01	
Human via environment, Oral	0.000009802 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**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 (14): Consumer use - Consumer end-use of cosmetics**1. Exposure scenario (14)****Short title of the exposure scenario:**

Consumer use - 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:

Consumer uses e.g. as a carrier in cosmetics/personal care products, perfumes and fragrances. Note: For cosmetic and personal care products, risk assessment only required for the environment under REACH as human health is covered by alternative legislation.

Consumer application.

Generic exposure scenario: IFRA GES 10 (IU10).

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

2. Conditions of use affecting exposure**2.1 Control of consumer exposure****General:**

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

2.2 Control of environmental exposure**Product characteristics:**

Physical state: liquid.

Vapour pressure: <0.5 kPa.

Amounts used:

Daily wide dispersive use: 0.000006875 tons/day.

Percentage of tonnage used at regional scale: 10 %.

Frequency and duration of use:

Wide dispersive use.

Environmental factors not influenced by risk management:

Flow rate of receiving surface water: >=18000 m3/day (default).

Other given operational conditions affecting environmental exposure:

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: 0.007 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=87.61%).

Size of municipal sewage system/treatment plant: >=2000 m3/day (standard town).

Conditions and measures related to external treatment of waste for disposal:

External treatment and disposal of waste should comply with applicable local and/or national regulations.

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. Obligations according to Article 37(4) of REACH do not apply:

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 V2.2 - EUSES v2.1.

Environment

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Freshwater	0.000123 mg/L	0.103	
Freshwater sediment	0.003 mg/kg dw	0.072	
Marine water	0.00001187 mg/L	0.099	
Marine water sediment	0.0002822 mg/kg dw	0.07	
Soil	0.000207 mg/kg dw	0.029	
STP	0.0004258 mg/L	<0.01	

SDS Name: Kalama* Cyprinal

Effect/Compartment	Exposure estimate/PEC	RCR	Notes
Human via environment, Inhalation	0.000002093 mg/m3	<0.01	
Human via environment, Oral	0.000009802 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

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.