

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

1.1. Product identifier:

Product trade name: Kalama* Florosol
Company product number: FLOROSOL
REACH registration number: 01-0000015458-64-0004, Multi-constituent substance
Substance name: A mixture of: cis-tetrahydro-2-isobutyl-4-methylpyran-4-ol; trans-tetrahydro-2-isobutyl-4-methylpyran-4-ol
Substance identification number: EC 405-040-6; Index 603-101-00-3
Other means of identification: 32211; 2H-Pyran-4-ol, tetrahydro-4-methyl-2-(2-methylpropyl)-

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

Uses: Fragrance ingredient. Industrial applications. Professional applications. Consumer applications. See Annex for covered uses.
Uses advised against: Consumer products with potential for significant oral contact.

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. FAX: +44 (0) 151 423 8127.
For further information about this SDS: Email: product.compliance@emeraldmaterials.com

1.4. Emergency telephone number:

ChemTel (24 hours): 1-800-255-3924 (USA); +1-813-248-0585 (outside USA);
1-300-954-583 (Australia); 000-800-100-4086 (India).

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture:

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

Eye Irritation, category 2, H319

2.2. Label elements:

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

Hazard pictogram(s):



Signal word:

Warning

Hazard statements:

H319 Causes serious eye irritation.

Precautionary statements:

P280 Wear eye protection/face protection.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

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P337+P313 If eye irritation persists: Get medical advice/attention.

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.

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> |
|----------------|---|----------------|-----------------------|---------------------|
| 0063500-71-0 | Tetrahydro-2-isobutyl-4-methylpyran-4-ol, mixed isomers (cis and trans) | 95-100 | Eye Irrit. 2 | H319 |

| <u>CAS-No.</u> | <u>Chemical Name</u> | <u>Weight%</u> | <u>REACH Registration No.</u> | <u>EC/List Number</u> |
|----------------|---|----------------|-------------------------------|-----------------------|
| 0063500-71-0 | Tetrahydro-2-isobutyl-4-methylpyran-4-ol, mixed isomers (cis and trans) | 95-100 | 01-0000015458-64-0004 | 405-040-6 |

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

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

SECTION 4: First aid measures

4.1. Description of first aid measures:

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

Eye contact: 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.

Skin contact: Wash the affected area thoroughly with plenty of soap and water. Get medical attention if symptoms occur.

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

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

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

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

Irritation. Pre-existing skin problems may be aggravated by prolonged or repeated contact. 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.

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

5.3. Advice for firefighters:

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

See section 9 for additional information.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures:

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

6.2. Environmental precautions:

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

6.3. Methods and material for containment and cleaning up:

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

6.4. References to other sections:

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

SECTION 7: Handling and storage

7.1. Precautions for safe handling:

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

7.2. Conditions for safe storage, including any incompatibilities:

Store cool and dry, under well-ventilated conditions. Store this material away from incompatible substances (see section 10). Do not store in open, unlabeled or mislabeled containers. Keep container closed when not in use. Do not reuse empty container without commercial cleaning or reconditioning. Empty container contains residual product which may exhibit hazards of product.

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

Tetrahydro-2-isobutyl-4-methylpyran-4-ol, mixed isomers (cis and trans)

EU OELV

N/E

EU IOELV

N/E

ACGIH - TWA/Ceiling

N/E

ACGIH - STEL

N/E

Chemical Name

UK WEL

Ireland OEL

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| | | |
|---|----------------------|---------------------------|
| Chemical Name Tetrahydro-2-isobutyl-4-methylpyran-4-ol, mixed isomers (cis and trans) | 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) - Workers:

| Chemical Name | Inhalation-Acute (local) | Inhalation-Acute (systemic) | Inhalation-Long Term (local) | Inhalation-Long Term (systemic) |
|---|---------------------------------|------------------------------------|-------------------------------------|--|
| Tetrahydro-2-isobutyl-4-methylpyran-4-ol, mixed isomers (cis and trans) | N/E | N/E | N/E | 6.1 mg/m ³ |

| Chemical Name | Dermal-Acute (local) | Dermal-Acute (systemic) | Dermal-Long Term (local) | Dermal-Long Term (systemic) |
|---|-----------------------------|--------------------------------|---------------------------------|------------------------------------|
| Tetrahydro-2-isobutyl-4-methylpyran-4-ol, mixed isomers (cis and trans) | N/E | N/E | N/E | 3.9 mg/kg bw/day |

Predicted No Effect Concentration (PNECs):

| Chemical Name | Freshwater | Marine water | Intermittent releases | Soil |
|---|-------------------|---------------------|------------------------------|----------------------|
| Tetrahydro-2-isobutyl-4-methylpyran-4-ol, mixed isomers (cis and trans) | 0.094 mg/L | 0.0094 mg/L | 0.94 mg/L | 0.0902 mg/kg soil dw |

| Chemical Name | Sediment (freshwater) | Sediment (marine) | STP | Oral |
|---|------------------------------|--------------------------|------------|--------------------------------|
| Tetrahydro-2-isobutyl-4-methylpyran-4-ol, mixed isomers (cis and trans) | 0.412 mg/kg sediment dw | 0.0412 mg/kg sediment dw | 10 mg/L | no potential to bioconcentrate |

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

TETRAHYDRO-2-ISOBUTYL-4-METHYLPYRAN-4-OL, MIXED ISOMERS (cis and trans): DNEL (Derived No Effect Level) for the general population:

- Inhalation, systemic effects, long-term: 1.8 mg/m³
- Dermal, systemic effects, long-term: 2.4 mg/kg bw/day
- Oral, systemic effects, long-term: 1 mg/kg bw/day

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: Safety glasses or goggles required.

Hand protection: Avoid skin contact when mixing or handling the material by wearing impervious and chemical resistant gloves. In case of prolonged immersion or frequently repeated contact, gloves with breakthrough times greater than 240 minutes (protection class 5 or greater) are recommended. For brief contact or splash applications, gloves with breakthrough times of 10 minutes or greater are recommended (protection class 1 or greater). Suggested material for protective gloves: PVC (polyvinyl chloride). The protective gloves to be used must comply with the specifications of the EC directive 89/686/EEC 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. In case of insufficient ventilation, wear suitable respiratory equipment.

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:

| | | | |
|-----------------------------|---------------------------|---|---------------|
| Form: | Liquid | pH: | Not Available |
| Appearance: | Colorless to light yellow | Relative density: | 0.943-0.953 |
| Odour: | Floral | Partition coefficient (n-octanol/water): | 1.65 @ 23°C |
| Odour threshold: | Not Available | % Volatile by weight: | Not Available |
| Solubility in water: | Partly soluble | VOC: | Not Available |
| Evaporation rate: | Not Available | Boiling point °C: | 227 °C |

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| | | | |
|--------------------------------------|-------------------------------|--|--|
| Vapour pressure: | 0.005 kPa (0.04 mm Hg) @ 20°C | Boiling point °F: | 440 °F |
| Vapour density: | Not Available | Flash point: | 106 °C (223 °F) Closed Cup |
| Viscosity: | 234 mPa.s @ 20°C | Autoignition temperature: | 328°C (622°F) |
| Melting point/Freezing point: | Not Available | Flammability (solid, gas): | Not Applicable (liquid) |
| Oxidising properties: | Not oxidizing | Flammability or explosive limits: | LFL/LEL: Not Available UFL/UEL: Not Available |
| Explosive properties: | Not explosive | | |
| Decomposition temperature: | Not Available | | |

9.2. Other information:

Amounts specified are typical and do not represent a specification.

SECTION 10: Stability and reactivity

10.1. Reactivity:

None known.

10.2. Chemical stability:

This product is stable.

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 contact with strong oxidizing agents.

10.6. Hazardous decomposition products:

Carbon dioxide, carbon monoxide and hydrocarbons.

SECTION 11: Toxicological information

11.1. Information on toxicological effects:

Information on likely routes of exposure:

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

Eyes: Causes serious eye irritation.

Skin: 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: Ingestion may cause irritation.

Acute toxicity information: 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> |
|---|------------------------|----------------|------------------|----------------|--------------------|----------------|
| Tetrahydro-2-isobutyl-4-methylpyran-4-ol, mixed isomers (cis and trans) | N/E | N/E | >2000 mg/kg | Rat/ adult | >2000 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> |
|---|------------------------|----------------|
| Tetrahydro-2-isobutyl-4-methylpyran-4-ol, mixed isomers (cis and trans) | Mild irritant | Rabbit/ adult |

Serious eye damage/irritation: Causes serious eye irritation - Category 2.

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Chemical Name

Tetrahydro-2-isobutyl-4-methylpyran-4-ol, mixed isomers (cis and trans)

Eye irritation

Irritant

Species

Rabbit/ adult

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

Chemical Name

Tetrahydro-2-isobutyl-4-methylpyran-4-ol, mixed isomers (cis and trans)

Skin sensitisation

Non-sensitizer

Species

Guinea Pig/ adult

Carcinogenicity: Not classified (no relevant information found).

Germ cell mutagenicity: Not classified (based on available data, the classification criteria are not met). TETRAHYDRO-2-ISOBUTYL-4-METHYLPYRAN-4-OL, MIXED ISOMERS (cis and trans): Mutagenic assays were negative for both in vivo and in vitro assays.

Reproductive toxicity: Not classified. TETRAHYDRO-2-ISOBUTYL-4-METHYLPYRAN-4-OL, MIXED ISOMERS (cis and trans): Reproductive toxicity, dermal, rats: NOAEL (no-observed adverse-effect-level) 1000 mg/kg bw/day. Developmental toxicity dermal, rats: NOAEL (no-observed-adverse-effect level), maternal toxicity=1000 mg/kg bw/day; NOAEL, developmental toxicity=1000 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). TETRAHYDRO-2-ISOBUTYL-4-METHYLPYRAN-4-OL, MIXED ISOMERS (cis and trans): Repeated dose toxicity study: NOAEL (No-Observed-Adverse-Effect-Level), oral, rat - 125 mg/kg bw/day; NOAEL, dermal, rat - 1000 mg/kg bw/day.

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

Other toxicity information: No additional information available.

SECTION 12: Ecological information

12.1. Toxicity:

Chemical Name

Tetrahydro-2-isobutyl-4-methylpyran-4-ol, mixed isomers (cis and trans)

Fish 96 hour LC50

354 mg/L

Fish 96 hour LC50

N/E

Fish Chronic NOEC

N/E

Chemical Name

Tetrahydro-2-isobutyl-4-methylpyran-4-ol, mixed isomers (cis and trans)

Invertebrates 48 hour EC50

320 mg/L

Invertebrates 24 hour EC50

N/E

Invertebrates Chronic NOEC

N/E

Chemical Name

Tetrahydro-2-isobutyl-4-methylpyran-4-ol, mixed isomers (cis and trans)

Algae 96 hour EC50

N/E

Algae 72 hour EC50

>100 mg/L

Algae Chronic NOEC

N/E

12.2. Persistence and degradability:

Chemical Name

Tetrahydro-2-isobutyl-4-methylpyran-4-ol, mixed isomers (cis and trans)

Biodegradation

Not readily biodegradable (OECD 301B)

12.3. Bioaccumulative potential:

Chemical Name

Tetrahydro-2-isobutyl-4-methylpyran-4-ol, mixed isomers (cis and trans)

Bioconcentration Factor (BCF)

N/E

Log Kow

1.65 @ 23°C

12.4. Mobility in soil:

Chemical Name

Tetrahydro-2-isobutyl-4-methylpyran-4-ol, mixed isomers (cis and trans)

Mobility in soil (Koc/Kow)

41.48 (calculated)

12.5. Results of PBT and vPvB assessment:

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

12.6. Other adverse effects:

No additional information available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods:

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

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

SECTION 14: Transport information

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

14.1. UN number: N/A

14.2. UN proper shipping name:

Not regulated - See Bill of Lading for Details

14.3. Transport hazard class(es):

U.S. DOT hazard class: N/A

Canada TDG hazard class: N/A

Europe ADR/RID hazard class: N/A

IMDG Code (ocean) hazard class: N/A

ICAO/IATA (air) hazard class: N/A

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

14.4. Packing group: N/A

14.5. Environmental hazards:

Marine pollutant: Not Applicable

Hazardous substance (USA): Not Applicable

14.6. Special precautions for user:

Not Applicable

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

Not Applicable

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. 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:

| <u>Regulation</u> | <u>Status</u> |
|--|---------------|
| Australian Inventory of Chemical Substances (AICS): | Y |
| Canadian Domestic Substances List (DSL): | Y |
| Canadian Non-Domestic Substances List (NDSL): | N |
| China Inventory of Existing Chemical Substances (IECSC): | Y |
| European EC Inventory (EINECS, ELINCS, NLP): | Y |
| Japan Existing and New Chemical Substances (ENCS): | N |
| Japan Industrial Safety and Health Law (ISHL): | N |

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Regulation

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

Status

Y
Y
Y
Y
Y

A "Y" listing indicates all intentionally added components are either listed or are otherwise compliant with the regulation. A "N" listing indicates that for one or more components: 1) there is no listing on the public inventory; 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.

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):

H319 Causes serious eye irritation.

Reason for revision: Changes in Section(s): 15

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

Legend:

* : Trademark owned by Emerald Performance Materials, LLC.
ACGIH: American Conference of Governmental Industrial Hygienists
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
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
Vancouver, WA 98683
United States

Annex

Exposure Scenarios

Substance information:

Name of substance: 2H-Pyran-4-ol, tetrahydro-4-methyl-2-(2-methylpropyl)-.
EC# 405-040-6 / CAS# 63500-71-0
REACH Registration number: 01-0000015458-64-0004.

List of exposure scenarios:

ES1: Industrial formulation
ES2: Industrial compounding
ES3: Use in cleaning agents - Industrial
ES4: Use in cleaning agents and polishes - Professional
ES5: Use in cleaning agents - Consumer
ES6: Use in Air Care
ES7: Consumer use of cosmetics
ES8: Other consumer use as fragrance material

General remarks:

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As no environmental hazard was identified, no environmental-related exposure assessment and risk characterization was performed. The first tier worker exposure assessments have at first instance been performed using EasyTRA 4.1.0 and ECETOC TRA version 3.0 (ECETOC TRA v3). For all consumer contributing scenarios second tier consumer exposure assessments have been performed using ConsExpo v4.1.

Exposure scenario (1): Industrial formulation

1. Exposure scenario (1)

Short title of the exposure scenario:

Industrial formulation

List of use descriptors:

Sector of use category (SU): SU10

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

Environmental release category (ERC): ERC2

List of names of contributing worker scenarios and corresponding PROCs:

PROC1 Use in closed process, no likelihood of exposure. Use of the substances in high integrity contained system where little potential exists for exposures, e.g. any sampling via closed loop systems.

PROC3 Use in closed batch process (synthesis or formulation). Batch manufacture of a chemical or formulation where the predominant handling is in a contained manner, e.g. through enclosed transfers, but where some opportunity for contact with chemicals occurs, e.g. through sampling.

PROC5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). Manufacture or formulation of chemical products or articles using technologies related to mixing and blending of solid or liquid materials, and where the process is in stages and provides the opportunity for significant contact at any stage.

PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. Sampling, loading, filling, transfer, dumping, bagging in non-dedicated facilities. Exposure related to dust, vapour, aerosols or spillage, and cleaning of equipment to be expected.

PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. Sampling, loading, filling, transfer, dumping, bagging in dedicated facilities. Exposure related to dust, vapour, aerosols or spillage, and cleaning of equipment to be expected.

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

PROC14 Production of preparations or articles by tableting, compression, extrusion, pelletisation. Processing of preparations and/or substances (liquid and solid) into preparations or articles. Substances in the chemical matrix may be exposed to elevated mechanical and/or thermal energy conditions. Exposure is predominantly related to volatiles and/or generated fumes, dust may be formed as well.

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 of preparations. Mixing and blending of substances into (chemical) preparations in all types of formulating industries, such as paints and do-it-yourself products, pigment paste, fuels, household products (cleaning products), lubricants, etc.

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).

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. Wear chemical resistant gloves in combination with basic employee training. Avoid contact with eyes.

PROC8a, PROC9, PROC14: In accordance to the Article 14 (2a-f) of the REACH Regulation (EC) No 1907/2006, exposure estimation and risk characterisation does not need to be performed if the substance in a preparation is less than 1%.

Product characteristics:

Concentration of substance:

- PROC1, PROC3, PROC5, PROC8b, PROC15: Up to 25% (a linear concentration reduction approach is used).

- PROC8a, PROC9, PROC14: Up to 1%.

Physical state: liquid.

Vapour pressure: 1 Pa.

Fugacity: Low.

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| | |
|---|--|
| Frequency and duration of use/exposure: | Duration: 5 days/week - PROC3, PROC5: 1-4 hours/day. - PROC1, PROC8b: 15 minutes-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: 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. |
| 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). - PROC3: Closed batch process with occasional controlled exposure. - PROC5, PROC8b, PROC15: No. Local exhaust ventilation: Not required. |
| 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 basic employee training), Gloves APF 10 (minimum efficiency 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: As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

3. Exposure estimation and reference to its source

Health

Information for contributing scenario (1): PROC5, PROC8b

Assessment method: EasyTRA 4.1.0 and ECETOC TRA Worker v3. Only highest figures are presented here.

Exposure estimation:

| | Route | Exposure estimate | RCR | Notes |
|-----------------------------|-----------------|--------------------------|------------|---------------|
| Worker, long-term, systemic | Dermal | 0.342857 mg/kg bw/day | 0.087912 | PROC5, PROC8b |
| Worker, long-term, systemic | Inhalation | 5.383 mg/m3 | 0.882521 | PROC5 |
| Worker, long-term, systemic | Combined routes | 1.112 mg/kg bw/day | 0.970433 | PROC5 |

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: 5 days/week. PROC3, PROC5: 1-4 hours/day. PROC1, PROC8b: 15 minutes-1 hour/day. PROC15: <15 minutes. Dermal protection: Yes (chemically resistant gloves conforming to EN374 with basic employee training). Gloves APF 10 (minimum efficiency dermal: 90%). Concentration of substance: PROC1, PROC3, PROC5, PROC8b, PROC15: Up to 25% (a linear concentration reduction approach is used). PROC8a, PROC9, PROC14: Up to 1%.

Exposure scenario (2): Industrial compounding

1. Exposure scenario (2)

Short title of the exposure scenario:

Industrial compounding

List of use descriptors:

Sector of use category (SU): SU10

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

Environmental release category (ERC): ERC2

List of names of contributing worker scenarios and corresponding PROCs:

PROC1 Use in closed process, no likelihood of exposure. Use of the substances in high integrity contained system where little potential exists

for exposures, e.g. any sampling via closed loop systems.

PROC3 Use in closed batch process (synthesis or formulation). Batch manufacture of a chemical or formulation where the predominant handling is in a contained manner, e.g. through enclosed transfers, but where some opportunity for contact with chemicals occurs, e.g. through sampling.

PROC5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). Manufacture or formulation of chemical products or articles using technologies related to mixing and blending of solid or liquid materials, and where the process is in stages and provides the opportunity for significant contact at any stage.

PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. Sampling, loading, filling, transfer, dumping, bagging in non-dedicated facilities. Exposure related to dust, vapour, aerosols or spillage, and cleaning of equipment to be expected.

PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. Sampling, loading, filling, transfer, dumping, bagging in dedicated facilities. Exposure related to dust, vapour, aerosols or spillage, and cleaning of equipment to be expected.

PROC9 Transfer of substance or preparation 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 of preparations. Mixing and blending of substances into (chemical) preparations in all types of formulating industries, such as paints and do-it-yourself products, pigment paste, fuels, household products (cleaning products), lubricants, etc.

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).

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. Wear chemical resistant gloves in combination with basic employee training. Avoid contact with eyes. |
| Product characteristics: | Concentration of substance: - PROC8a, PROC9: Up to 25% (a linear concentration reduction approach is used). - PROC3, PROC5: Up to 25%. - PROC1, PROC8b, PROC15: Up to 100%. Physical state: liquid. Vapour pressure: 1 Pa. Fugacity: Low. |
| Frequency and duration of use/exposure: | Duration: 5 days/week - PROC3, PROC5, PROC8a: 1-4 hours/day. - PROC1, PROC8b, PROC9: 15 minutes-1 hour/day. - PROC15: <15 minutes. |
| Human factors not influenced by risk management: | Exposed skin surface: - PROC1, PROC3, PROC15: 240 cm ² (one hand, face side only). - PROC5, PROC9: 480 cm ² (two hands, face side only). - PROC8a, PROC8b: 960 cm ² (two hands). |
| Other given operational conditions affecting workers exposure: | Location: Indoor use. Domain: Industrial use. |
| Technical conditions and measures to control dispersion from source towards the worker: | General ventilation: - PROC1, PROC3, PROC5, PROC8b, PROC9, PROC15: Basic general ventilation (1-3 air changes per hour): 0%. - PROC8a: 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. - PROC5, PROC8a, PROC8b, PROC9, PROC15: No. Local exhaust ventilation: - PROC1, PROC8a, PROC9, PROC15: Not required. - PROC3, PROC5: Yes (90% effectiveness). - PROC8b: Yes (95% effectiveness). |

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

Respiratory protection: Not required.
 Dermal protection:
 - PROC1, PROC3, PROC8a, PROC8b, PROC9, PROC15: Yes (chemically resistant gloves conforming to EN374 with basic employee training), Gloves APF 10 (minimum efficiency dermal: 90%).
 - PROC5: Yes (chemically resistant gloves conforming to EN374 with specific activity training), Gloves APF 20 (minimum efficiency 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.
 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:**

As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

3. Exposure estimation and reference to its source**Health**

Information for contributing scenario (1): PROC8a, PROC8b, PROC15

Assessment method: EasyTRA 4.1.0 and ECETOC TRA Worker v3. Only highest figures are presented here.

Exposure estimation:

| | Route | Exposure estimate | RCR | Notes |
|-----------------------------|-----------------|--------------------------|------------|--------------|
| Worker, long-term, systemic | Dermal | 1.371 mg/kg bw/day | 0.351648 | PROC8b |
| Worker, long-term, systemic | Inhalation | 3.589 mg/m3 | 0.588347 | PROC15 |
| Worker, long-term, systemic | Combined routes | 0.804289 mg/kg bw/day | 0.617424 | PROC8a |

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: 5 days/week. PROC3, PROC5, PROC8a: 1-4 hours/day. PROC1, PROC8b, PROC9: 15 minutes-1 hour/day. PROC15: <15 minutes. Dermal protection: Yes (chemically resistant gloves conforming to EN374 with basic employee training). PROC1, PROC3, PROC8a, PROC8b, PROC9, PROC15: Gloves APF 10 (minimum efficiency dermal: 90%). PROC5: Gloves APF 20 (minimum efficiency dermal: 95%). Concentration of substance: PROC8a, PROC9: Up to 25% (a linear concentration reduction approach is used). PROC3, PROC5: Up to 25%. PROC1, PROC8b, PROC15: Up to 100%.

Exposure scenario (3): Use in cleaning agents - Industrial**1. Exposure scenario (3)****Short title of the exposure scenario:**

Use in cleaning agents - Industrial

List of use descriptors:

Process category (PROC): PROC2, PROC4, PROC7, PROC8a, PROC8b, PROC10, PROC13
 Environmental release category (ERC): ERC4

List of names of contributing worker scenarios and corresponding PROCs:

PROC2 Use in closed, continuous process with occasional controlled exposure. Continuous process but where the design philosophy is not specifically aimed at minimizing emissions. It is not high integrity and occasional exposure will arise e.g. through maintenance, sampling and equipment breakages.

PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises. Use in batch manufacture of a chemical where significant opportunity for exposure arises, e.g. during charging, sampling or discharge of material, and when the nature of the design is likely to result in exposure.

PROC7 Industrial spraying. Air dispersive techniques. Spraying for surface coating, adhesives, polishes/cleaners, air care products, sandblasting. Substances can be inhaled as aerosols. The energy of the aerosol particles may require advanced exposure controls; in case of coating, overspray may lead to waste water and waste.

PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. Sampling, loading, filling, transfer, dumping, bagging in non-dedicated facilities. Exposure related to dust, vapour, aerosols or spillage, and cleaning of equipment to be expected.

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PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. Sampling, loading, filling, transfer, dumping, bagging in dedicated facilities. Exposure related to dust, vapour, aerosols or spillage, and cleaning of equipment to be expected.

PROC10 Roller application or brushing. Low energy spreading of e.g. coatings. Including cleaning of surfaces. Substance can be inhaled as vapours, skin contact can occur through droplets, splashes, working with wipes and handling of treated surfaces.

PROC13 Treatment of articles by dipping and pouring. Immersion operations. Treatment of articles by dipping, pouring, immersing, soaking, washing out or washing in substances; including cold formation or resin type matrix. Includes handling of treated objects (e.g. after dyeing, plating,). Substance is applied to a surface by low energy techniques such as dipping the article into a bath or pouring a preparation onto a surface.

Name of contributing environmental scenario and corresponding ERCs:

ERC4 Industrial use of processing aids in processes and products, not becoming part of articles. Industrial use of processing aids in continuous processes or batch processes applying dedicated or multi-purpose equipment, either technically controlled or operated by manual interventions. For example, solvents used in chemical reactions or the 'use' of solvents during the application of paints, lubricants in metal working fluids, anti-set off agents in polymer moulding/casting.

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: In accordance to the Article 14 (2a-f) of the REACH Regulation (EC) No 1907/2006, exposure estimation and risk characterisation does not need to be performed if the substance in a preparation is less than 1%.

2.2 Control of environmental exposure

General: As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

3. Exposure estimation and reference to its source

In accordance to the Article 14 (2a-f) of the REACH Regulation (EC) No 1907/2006, exposure estimation and risk characterisation does not need to be performed if the substance in a preparation is less than 1%.

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

Health: Concentration of substance: Up to 1%.

Exposure scenario (4): Use in cleaning agents and polishes - Professional**1. Exposure scenario (4)****Short title of the exposure scenario:**

Use in cleaning agents and polishes - Professional

List of use descriptors:

Process category (PROC): PROC2, PROC4, PROC8a, PROC8b, PROC10, PROC11, PROC13

Environmental release category (ERC): ERC8a, ERC8d

List of names of contributing worker scenarios and corresponding PROCs:

PROC2 Use in closed, continuous process with occasional controlled exposure. Continuous process but where the design philosophy is not specifically aimed at minimizing emissions. It is not high integrity and occasional exposure will arise e.g. through maintenance, sampling and equipment breakages.

PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises. Use in batch manufacture of a chemical where significant opportunity for exposure arises, e.g. during charging, sampling or discharge of material, and when the nature of the design is likely to result in exposure.

PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. Sampling, loading, filling, transfer, dumping, bagging in non-dedicated facilities. Exposure related to dust, vapour, aerosols or spillage, and cleaning of equipment to be expected.

PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. Sampling, loading, filling, transfer, dumping, bagging in dedicated facilities. Exposure related to dust, vapour, aerosols or spillage, and cleaning of equipment to be expected.

PROC10 Roller application or brushing. Low energy spreading of e.g. coatings. Including cleaning of surfaces. Substance can be inhaled as vapours, skin contact can occur through droplets, splashes, working with wipes and handling of treated surfaces.

PROC11 Non industrial spraying. Air dispersive techniques. Spraying for surface coating, adhesives, polishes/cleaners, air care products, sandblasting. Substances can be inhaled as aerosols. The energy of the aerosol particles may require advanced exposure controls.

PROC13 Treatment of articles by dipping and pouring. Immersion operations. Treatment of articles by dipping, pouring, immersing, soaking, washing out or washing in substances; including cold formation or resin type matrix. Includes handling of treated objects (e.g. after dyeing, plating,). Substance is applied to a surface by low energy techniques such as dipping the article into a bath or pouring a preparation onto a surface.

Name of contributing environmental scenario and corresponding ERCs:

ERC8a Wide dispersive indoor use of processing aids in open systems. Indoor use of processing aids by the public at large or professional use.

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Use (usually) results in direct release into the environment/sewage system, for example, detergents in fabric washing, machine wash liquids and lavatory cleaners, automotive and bicycle care products (polishes, lubricants, de-icers), solvents in paints and adhesives or fragrances and aerosol propellants in air fresheners.

ERC8d Wide dispersive outdoor use of processing aids in open systems. Outdoor use of processing aids by the public at large or professional use. Use (usually) results in direct release into the environment, for example, automotive and bicycle care products (polishes, lubricants, de-icers, detergents), solvents in paints and adhesives.

Further explanations:

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: In accordance to the Article 14 (2a-f) of the REACH Regulation (EC) No 1907/2006, exposure estimation and risk characterisation does not need to be performed if the substance in a preparation is less than 1%.

2.2 Control of environmental exposure

General: As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

3. Exposure estimation and reference to its source

In accordance to the Article 14 (2a-f) of the REACH Regulation (EC) No 1907/2006, exposure estimation and risk characterisation does not need to be performed if the substance in a preparation is less than 1%.

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

Health: Concentration of substance: Up to 1%.

Exposure scenario (5): Use in cleaning agents - Consumer

1. Exposure scenario (5)

Short title of the exposure scenario:

Use in cleaning agents - Consumer

List of use descriptors:

Product category (PC): PC31, PC35

Environmental release category (ERC): ERC8a, ERC8d

Name of contributing environmental scenario and corresponding ERCs:

ERC8a Wide dispersive indoor use of processing aids in open systems. Indoor use of processing aids by the public at large or professional use. Use (usually) results in direct release into the environment/sewage system, for example, detergents in fabric washing, machine wash liquids and lavatory cleaners, automotive and bicycle care products (polishes, lubricants, de-icers), solvents in paints and adhesives or fragrances and aerosol propellants in air fresheners.

ERC8d Wide dispersive outdoor use of processing aids in open systems. Outdoor use of processing aids by the public at large or professional use. Use (usually) results in direct release into the environment, for example, automotive and bicycle care products (polishes, lubricants, de-icers, detergents), solvents in paints and adhesives.

Further explanations:

PC31: Polishes and wax blends.

PC35: Washing and cleaning products (including solvent based products).

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: Based on current knowledge there are no preparations / formulations which contain this substance in concentrations > 1%. Assessment of uses of this substance in consumer products has not been performed as there were no end products identified which contain more than 1% of this substance.

2.2 Control of environmental exposure

General: As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

3. Exposure estimation and reference to its source

In accordance to the Article 14 (2a-f) of the REACH Regulation (EC) No 1907/2006, exposure estimation and risk characterisation does not need to be performed if the substance in a preparation is less than 1%.

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

Health: Concentration of substance: Up to 1%.

Exposure scenario (6): Use in Air Care**1. Exposure scenario (6)****Short title of the exposure scenario:**

Use in Air Care

List of use descriptors:

Product category (PC): PC3

Environmental release category (ERC): ERC8a

Name of contributing environmental scenario and corresponding ERCs:

ERC8a Wide dispersive indoor use of processing aids in open systems. Indoor use of processing aids by the public at large or professional use. Use (usually) results in direct release into the environment/sewage system, for example, detergents in fabric washing, machine wash liquids and lavatory cleaners, automotive and bicycle care products (polishes, lubricants, de-icers), solvents in paints and adhesives or fragrances and aerosol propellants in air fresheners.

Further explanations:

PC3 Air care products.

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****Product characteristics:**

Concentration of substance in product: Up to 7%.

Airborne fraction of the non-volatile material: 100%.

Weight fraction of the non-volatile material: 1.5%

Amounts used:

Applied amounts for each use event: Inhalation mass generation rate 0.000022 g/sec for spray duration 2.88E4 sec.

Frequency and duration of use/exposure:

Frequency - covers use frequency: 150 times/year.

Other given operational conditions affecting consumers exposure:

Inhalation exposure model - covers use in room size: room size of 16 m3.

Conditions and measures related to personal protection and hygiene:

General ventilation: ventilation rate: 1 l/ hour.

2.2 Control of environmental exposure**General:**

As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

3. Exposure estimation and reference to its source**Health**

Information for contributing scenario (1): PC3

Assessment method: ConsExpo v4.1.

Exposure estimation:

| | <u>Route</u> | <u>Exposure estimate</u> | <u>RCR</u> | <u>Notes</u> |
|-------------------------------|-----------------|--------------------------|------------|--------------|
| Consumer, long-term, systemic | Inhalation | 0.02992 mg/m3 | 0.016622 | |
| Consumer, long-term, systemic | Combined routes | 0.005048 mg/kg bw/day | 0.016622 | |

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. Concentration of substance in product: Up to 7%.

Exposure scenario (7): Consumer use of cosmetics**1. Exposure scenario (7)****Short title of the exposure scenario:**

Consumer 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 Wide dispersive indoor use of processing aids in open systems. Indoor use of processing aids by the public at large or professional use.

Use (usually) results in direct release into the environment/sewage system, for example, detergents in fabric washing, machine wash liquids and lavatory cleaners, automotive and bicycle care products (polishes, lubricants, de-icers), solvents in paints and adhesives or fragrances and

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aerosol propellants in air fresheners.

Further explanations:

PC28: Perfumes, fragrances.

PC39: Cosmetics, personal care products.

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

General: As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

3. Exposure estimation and reference to its source

For cosmetic and personal care products, risk assessment is not required under REACH as human health is covered by alternative legislation.

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

Health: No other specific measures identified.

Exposure scenario (8): Other consumer use as fragrance material

1. Exposure scenario (8)

Short title of the exposure scenario:

Other consumer use as fragrance material

List of use descriptors:

Product category (PC): PC8

Environmental release category (ERC): ERC8a, ERC8d

Name of contributing environmental scenario and corresponding ERCs:

ERC8a Wide dispersive indoor use of processing aids in open systems. Indoor use of processing aids by the public at large or professional use. Use (usually) results in direct release into the environment/sewage system, for example, detergents in fabric washing, machine wash liquids and lavatory cleaners, automotive and bicycle care products (polishes, lubricants, de-icers), solvents in paints and adhesives or fragrances and aerosol propellants in air fresheners.

ERC8d Wide dispersive outdoor use of processing aids in open systems. Outdoor use of processing aids by the public at large or professional use. Use (usually) results in direct release into the environment, for example, automotive and bicycle care products (polishes, lubricants, de-icers, detergents), solvents in paints and adhesives.

Further explanations:

PC8 Biocidal products (e.g. Disinfectants, pest control): Insecticides/repellants - liquid/adult; Insecticides/repellants - liquid/child; Insecticides/repellants spray; Insecticides/repellants - spray post application/child; Disinfectants, pest control concentration <1%.

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: Disinfectants, pest control concentration <1%: Assessment of uses of this substance in consumer products has not been performed as there were no end products identified which contain more than 1% of this substance.

Product characteristics: Concentration of substance in product: Up to 1.4%.
Insecticides/repellants spray:
- Airborne fraction of the non-volatile material: 30%.
- Weight fraction of the non-volatile material: 1.8%

Amounts used: Applied amounts for each use event:
- Insecticides/repellants - liquid/adult: 6 g.
- Insecticides/repellants - liquid/child: 1.5 g.
- Insecticides/repellants spray: Inhalation mass generation rate 1.1 g/sec for spray duration 19.8 sec; Dermal contact rate 269 mg/min for 19.8 sec.
Skin contact area:
- Insecticides/repellants - liquid/adult; Insecticides/repellants spray: covers skin contact area up to:17500 cm2.
- Insecticides/repellants - liquid/child; Insecticides/repellants - spray post application/child covers skin contact area up to: 4800 cm2.

Frequency and duration of use/exposure:

Duration covers exposure up to:
 - Insecticides/repellants - liquid/adult; Insecticides/repellants - liquid/child: 180 minutes/event (dermal, oral).
 - Insecticides/repellants spray: 19.8 seconds/event (inhalation, dermal).
 - Insecticides/repellants - spray post application/child: 3600 seconds/event (dermal); 60 minutes/event (oral).
 Frequency - covers use frequency:
 - Insecticides/repellants - liquid/adult; Insecticides/repellants - liquid/child: 54 times/year.
 - Insecticides/repellants spray; Insecticides/repellants - spray post application/child: 90 times/year.

Human factors not influenced by risk management:

Ingestion rate:
 - Insecticides/repellants - liquid/adult: 0.00133 mg/min.
 - Insecticides/repellants - liquid/child: 0.00083 mg/min.
 - Insecticides/repellants - spray post application/child: 0.010496 mg/min.

Other given operational conditions affecting consumers exposure:

Insecticides/repellants spray: Covers use in room size of 58 m3.
 Insecticides/repellants - spray post application/child: Rubbed surface 22 m2; Dislodgeable amount 0.000082 g/cm2; Transfer coefficient: 1.667 cm2/s.
 Uptake fraction: 100%.

Conditions and measures related to personal protection and hygiene:

Insecticides/repellants spray: General ventilation:ventilation rate: 0.5 l/ hour.

2.2 Control of environmental exposure

General:

As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

3. Exposure estimation and reference to its source

Health

Information for contributing scenario (1): PC8

Assessment method: ConsExpo v4.1. Only highest figures are presented here.

Exposure estimation:

| | Route | Exposure estimate | RCR | Notes |
|-------------------------------|-----------------|--------------------------|------------|--|
| Consumer, long-term, systemic | Dermal | 0.35752 mg/kg bw/day | 0.148967 | Insecticides/repellants - liquid/child |
| Consumer, long-term, systemic | Inhalation | 0.005683 mg/m3 | 0.003157 | Insecticides/repellants spray |
| Consumer, long-term, systemic | Oral | 0.00025 mg/kg bw/day | 0.00025 | Insecticides/repellants - spray post application/child |
| Consumer, long-term, systemic | Combined routes | 0.357556 mg/kg bw/day | 0.149002 | Insecticides/repellants - liquid/child |

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.