



Safety Data Sheet

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

Revision date: 2020-01-16

Supersedes: 2019-01-09

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

1.1. Product identifier:

Product trade name: Kalama* Benzyl Benzoate USP/FCC
Company product number: BOB
REACH registration number: 01-2119976371-33-0013
Substance name: Benzyl benzoate
Substance identification number: EC 204-402-9
Other means of identification: Not Available

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

Uses: Fixing agent. Intermediate. Laboratory chemical. Odour agent. Processing aid. Solvent. Viscosity adjuster. Impregnating agent. See Annex for covered uses.
Uses advised against: None identified

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

Manufacturer/Supplier: Emerald Performance Materials, LLC
Emerald Kalama Chemical, LLC
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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:

Acute Toxicity, Oral, category 4 , H302
Hazardous to the aquatic environment, Acute, category 1, H400
Hazardous to the aquatic environment, Chronic, category 2, H411

2.2. Label elements:

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

Hazard pictogram(s):

**Signal word:**

Warning

Hazard statements:

H302 Harmful if swallowed.

H400 Very toxic to aquatic life.

H411 Toxic to aquatic life with long lasting effects.

Precautionary statements:

P264 Wash skin thoroughly after handling.

P273 Avoid release to the environment.

P301+P312 IF SWALLOWED: Call a POISON CENTRE/doctor if you feel unwell.

P391 Collect spillage.

Supplemental information:

No Additional Information

Precautionary statements are listed according to the United Nations Globally Harmonized System of Classification and Labelling of Chemicals (GHS) - Annex III and 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>
000120-51-4	Benzyl benzoate	99-100	Acute Tox. 4 Oral- Aquatic Acute 1- Aquatic Chronic 2	H302-400-411

<u>CAS-No.</u>	<u>Chemical Name</u>	<u>Weight%</u>	<u>REACH Registration No.</u>	<u>EC/List Number</u>
000120-51-4	Benzyl benzoate	99-100	01-2119976371-33-0013	204-402-9

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

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

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

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

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

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

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

5.2. Special hazards arising from the substance or mixture:

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

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

5.3. Advice for firefighters:

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

See section 9 for additional information.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures:

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

6.2. Environmental precautions:

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

6.3. Methods and material for containment and cleaning up:

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

6.4. References to other sections:

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

SECTION 7: Handling and storage

7.1. Precautions for safe handling:

As with any chemical product, use good laboratory/workplace procedures. Do not cut, puncture, or weld on or near the container. Do not ingest, taste, or swallow. 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. 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

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container without commercial cleaning or reconditioning. Empty container contains residual product which may exhibit hazards of product. Product can easily oxidize. It is recommended that opened containers be padded with nitrogen. Protect from light.

7.3. Specific end use(s):

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

SECTION 8: Exposure controls / personal protection

8.1. Control parameters:

Occupational exposure limits (OEL):

<u>Chemical Name</u>	<u>EU OELV</u>	<u>EU IOELV</u>	<u>ACGIH - TWA/Ceiling</u>	<u>ACGIH - STEL</u>
Benzyl benzoate	N/E	N/E	N/E	N/E
<u>Chemical Name</u>	<u>UK WEL</u>	<u>Ireland OEL</u>		
Benzyl benzoate	N/E	N/E		

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

Derived No Effect Levels (DNELs):

Benzyl benzoate

<u>Population</u>	<u>Route</u>	<u>Acute (local)</u>	<u>Acute (systemic)</u>	<u>Long Term (local)</u>	<u>Long Term (systemic)</u>
Workers	Inhalation	N/E	102 mg/m ³	N/E	5,1 mg/m ³
Workers	Dermal	N/E	N/E	N/E	2,6 mg/kg bw/day
General population	Inhalation	N/E	25 mg/m ³	N/E	1,25 mg/m ³
General population	Dermal	N/E	N/E	N/E	1,3 mg/kg bw/day
General population	Oral	N/E	78 mg/kg bw/day	N/E	0,4 mg/kg bw/day
Humans via the environment	Inhalation	N/E	N/E	N/E	1,25 mg/m ³
Humans via the environment	Oral	N/E	N/E	N/E	0,4 mg/kg bw/day

Predicted No Effect Concentration (PNECs):

Benzyl benzoate

<u>Compartment</u>	<u>PNEC</u>
Freshwater	0,0168 mg/L
Freshwater sediment	10,66 mg/kg dw
Marine water	0,00168 mg/L
Marine water sediment	1,07 mg/kg dw
Soil	2,12 mg/kg dw
STP	100 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 240 minutes (protection class 5 or greater) are recommended. For brief contact or splash applications, gloves with breakthrough times of 10 minutes or greater are recommended (protection class 1 or greater). The protective gloves to be used must comply with the specifications of the 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: Wear an approved respirator (e.g., an organic vapor respirator, a full face air purifying respirator for organic vapors, or a self-contained breathing apparatus) whenever exposure to aerosol, mist, spray, fume or vapor exceed the applicable exposure limit(s) of any chemical substance listed in this SDS.

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

Environmental exposure controls: See Sections 6 and 12.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties:

Form:	Liquid	pH:	Not Available
Appearance:	Colorless	Relative density:	1.116-1.120
Odour:	Slight	Partition coefficient (n-octanol/water):	3.97
Odour threshold:	Not Available	% Volatile by weight:	<15%
Solubility in water:	15.3 mg/L @ 20°C	VOC:	<15% ASTM D2369
Evaporation rate:	<1	Boiling point °C:	323 °C
Vapour pressure:	0.0305 Pa @ 25 °C	Boiling point °F:	614 °F
Vapour density:	7.3 (Air=1)	Flash point:	148 °C (298 °F) Closed Cup
Viscosity:	Not Available	Autoignition temperature:	480 °C (896 °F)
Melting point/Freezing point:	18-21 °C (64-70 °F) (solidification point)	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	Surface tension:	
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 and carbon monoxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects:

Information on likely routes of exposure:

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

Eyes: May cause eye irritation.

Skin: May be harmful in contact with skin. Repeated or prolonged skin contact may cause irritation.

Inhalation: Inhalation may cause irritation of the respiratory tract and mucous membranes.

Ingestion: Harmful if swallowed. Ingestion may cause nausea, vomiting and diarrhea.

Acute toxicity information: Harmful if swallowed - Category 4.

<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>
Benzyl benzoate	>5.57 mg/L (similar materials, 4 hours)	Rat/ adult	1160 mg/kg	Rat/ adult	>2 mL/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>
Benzyl benzoate	Non-irritant (OECD 404)	Rabbit/ adult

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>
Benzyl benzoate	Slight irritant	Rabbit/ adult

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

<u>Chemical Name</u>	<u>Skin sensitisation</u>	<u>Species</u>
Benzyl benzoate	Non-sensitizer	Local Lymph Node Assay (OECD 429)

Carcinogenicity: Not classified (no relevant information found).

Germ cell mutagenicity: Not classified (based on available data, the classification criteria are not met). BENZYL BENZOATE: Mutagenicity was negative in in-vivo genotoxicity assays. Mixed results were seen in in-vitro genotoxicity assays.

Reproductive toxicity: Not classified (based on available data, the classification criteria are not met). BENZYL BENZOATE: Prenatal Developmental toxicity, oral, rat: NOAEL (no-observed-adverse-effect-level) of 646 mg/kg bw/day (maternal toxicity, embryo/fetal developmental toxicity).

Specific target organ toxicity (STOT) - single exposure: Not classified (no relevant information found).

Specific target organ toxicity (STOT) - repeated exposure: Not classified (based on available data, the classification criteria are not met). BENZYL BENZOATE: Repeated dose study, oral, rat: NOAEL (no-observed-adverse-effect-level) =800 mg/kg bw/day (systemic effects). Repeated dose study, dermal, rat: NOAEL (no-observed-adverse-effect-level) =781 mg/kg bw/day (systemic effects).

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:

<u>Chemical Name</u>	<u>Species</u>	<u>Acute</u>	<u>Acute</u>	<u>Chronic</u>
Benzyl benzoate	Fish	LC50 2.32 mg/L (96 hours) (arithmetic mean measured)	N/E	ChV 0.237 mg/L (32 days) (calculated)
Benzyl benzoate	Invertebrates	EC50 3.09 mg/L (48 hours) (arithmetic mean measured)	N/E	NOEC 0.258 mg/L (21 days) (OECD 211)
Benzyl benzoate	Algae	EC50 0.475 mg/L (72 hours) (geometric mean measured)	N/E	NOEC 0.247 mg/L(72 hours) (geometric mean measured)
Benzyl benzoate	Micro-organisms	EC50 >10000 mg/L (3 hours)		

12.2. Persistence and degradability:

<u>Chemical Name</u>	<u>Biodegradation</u>
Benzyl benzoate	Readily biodegradable (EU method C4-D)

12.3. Bioaccumulative potential:

<u>Chemical Name</u>	<u>Bioconcentration Factor (BCF)</u>	<u>Log Kow</u>
Benzyl benzoate	193.4 L/kg (calculated)	3.97

12.4. Mobility in soil:

<u>Chemical Name</u>	<u>Mobility in soil (Koc/Kow)</u>
Benzyl benzoate	6310 L/kg (OECD 121)

12.5. Results of PBT and vPvB assessment:

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

12.6. Other adverse effects:

No additional information available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods:

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

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

SECTION 14: Transport information

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

14.1. UN number: UN3082

14.2. UN proper shipping name:

Environmentally hazardous substance, liquid, n.o.s. (Benzyl benzoate)

14.3. Transport hazard class(es):

U.S. DOT hazard class: N/A

Canada TDG hazard class: N/A

Europe ADR/RID hazard class: 9

IMDG Code (ocean) hazard class: 9

ICAO/IATA (air) hazard class: 9

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

14.4. Packing group: III

14.5. Environmental hazards:

Marine pollutant: Marine Pollutant (IMDG code 2.9.3).

Hazardous substance (USA): Not Applicable

14.6. Special precautions for user:

Not Applicable

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

Not Applicable

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

SECTION 15: Regulatory information

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

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:

Regulation

Status

<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):	Y
Japan Industrial Safety and Health Law (ISHL):	Y
Korean Existing and Evaluated Chemical Substances (KECL):	Y
New Zealand Inventory of Chemicals (NZIoC):	Y
Philippines Inventory of Chemicals and Chemical Substances (PICCS):	Y
Taiwan Inventory of Existing Chemicals:	Y
U.S. Toxic Substances Control Act (TSCA) (Active):	Y

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

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):

H302	Harmful if swallowed.
H400	Very toxic to aquatic life.
H411	Toxic to aquatic life with long lasting effects.

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

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:
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Annex

Exposure Scenarios

Substance information:

Name of substance: Benzyl benzoate.
 EC# 204-402-9 / CAS# 120-51-4
 REACH Registration number: 01-2119976371-33-0013

List of exposure scenarios:

ES1: Use at industrial sites - Use as an intermediate
 ES2: Formulation.
 ES3: Use at industrial sites - Industrial use of washing and cleaning products
 ES4: Use at industrial sites - Industrial manufacture of textiles, leather and fur
 ES5: Use at industrial sites - Use as processing aid
 ES6: Use by professional workers - Professional use of washing and cleaning products
 ES7: Use by professional workers - Professional use of polishes and wax blends
 ES8: Use by professional workers - Professional end-use of cosmetics
 ES9: Consumer use - Consumer end-use of washing and cleaning products
 ES10: Consumer use - Consumer end-use of air care products
 ES11: Consumer use - Consumer end-use of polishes and wax blends
 ES12: Consumer use - Consumer end-use of cosmetics

General remarks:

The first tier environmental exposure assessments have at first instance been performed using CHESAR v2.1. Higher tier assessments have been performed for industrial uses using information from downstream users on use patterns along with air and water emission abatement measures. If needed, maximum permissible emissions were set to ensure there is no risk to the environment.

The worker dermal and inhalation exposure assessments for industrial and professional uses have been performed using ECETOC TRA Worker v3 model integrated in the Chemical Safety Assessment and Reporting tool (CHESAR v2.0.1) or the Advanced REACH tool (ART) v1.5. A qualitative risk assessment is required in respect of the following endpoints: local dermal effects (short and long term); systemic dermal effects (short term). In order to reduce the potential for dermal exposure, "low hazard" is assigned (according to ECHA CSA Guidance Part E Table E3-1). The following operational conditions (OC) and risk management measures (RMM) are recommended for substances considered to be "low hazard":

- Minimisation of manual phases/work tasks;
- Work procedures minimising splashes and spills;
- Avoidance of contact with contaminated tools and objects;
- Regular cleaning of equipment and work area;
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs are followed;
- Training for staff on good practice
- Good standard of personal hygiene
- For tasks where potential splashes may arise, the following personal protective equipment is recommended: face shield, substance/task appropriate gloves and full skin coverage with appropriate light-weight barrier materials (e.g. coveralls).

The AISE REACT Consumer Tool or the ECETOC TRA 3 model (consumer module) have been used to assess consumer dermal, inhalation and oral exposures. The potential for dermal exposure for consumers is controlled through limiting the maximum concentration to 3% in consumer products as a consequence of its potential to cause local dermal effects.

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): SU9
 Product category (PC): PC19
 Process category (PROC): PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC15
 Environmental release category (ERC): ERC6a

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.
 PROC4 Chemical production where opportunity for exposure arises.
 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:

ERC6a Use of intermediate.

Further explanations:

PC19 Intermediate.

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. Local exhaust ventilation and gloves are considered.
Product characteristics:	Concentration of substance: Up to 100%. Physical state: liquid. Vapour pressure: 0,0305 Pa at 25 °C
Amounts used:	This information is not relevant for assessment of worker's exposure.
Frequency and duration of use/exposure:	Duration: - PROC1, PROC2, PROC3, PROC4, PROC5, PROC8b, PROC9, PROC15: <8 hours/day. - PROC8a: <1 hour/day.
Human factors not influenced by risk management:	Exposed skin surface: - PROC1, PROC3, PROC15: 240 cm2 (one hand, face side only). - PROC2, PROC4, 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. Assessment tool used: ECETOC TRA Worker v3 for inhalation and dermal exposure.
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. - PROC3: Closed batch process with occasional controlled exposure. - PROC4, PROC8b, PROC9: Semi-closed process with occasional controlled exposure. - PROC5, PROC8a, PROC15: No. Local exhaust ventilation: - PROC1: Not required. - PROC2, PROC3, PROC4, PROC5, PROC8a, PROC9, PROC15: Yes (90% effectiveness). - PROC8b: Yes (95% effectiveness). Local exhaust ventilation (for dermal): - PROC1: Not required. - PROC2, PROC3, PROC4, PROC5, PROC8a, PROC9, PROC15: Yes (90% effectiveness). - PROC8b: 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: Yes (chemically resistant gloves conforming to EN374 with basic employee training) (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. For tasks where potential splashes may arise, the following personal protective equipment is recommended: face shield, substance/task appropriate gloves and full skin coverage with appropriate light-weight barrier materials (e.g. coveralls).
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: 0,0305 Pa at 25 °C
Amounts used:	Maximum daily use at a site: 1 ton/day. Maximum annual use at a site: 25 tons/year. Percentage of tonnage used at regional scale: 100 %.
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): 0,05; (final release): 0,05. Local release rate: 50 kg/day. Release fraction to wastewater from process (initial release): 0,02; (final release): 0,001. Local release rate: 1 kg/day. Release fraction to soil from process (final release): 0,001.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil:	Dry sludge application to agricultural soil: Yes (default). On-site treatment of wastewater: Removal of 95% of substance through 1) Organic phase separation and distillation of collected process and equipment cleaning water followed by organic phase incineration or 2) incineration of all collected process and equipment cleaning water (Effectiveness Water: 95%).
Conditions and measures related to municipal sewage treatment plant:	Municipal Sewage Treatment Plant (STP): Yes (Efficiency=90,9%). Size of municipal sewage system/treatment plant: >=2000 m3/day (standard town).
Conditions and measures related to external treatment of waste for disposal:	Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)
Conditions and measures related to external recovery of waste:	External recovery and recycling of waste should comply with applicable local and/or national regulations.
Additional good practice advice. 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

Health

Information for contributing scenario (1): PROC4, PROC5, PROC8a, PROC9, PROC15
 Assessment method: ECETOC TRA Worker v3. Only highest figures are presented here.
 Exposure estimation:

	Route	Exposure estimate	RCR	Notes
Worker, long-term, systemic	Dermal	0,137 mg/kg bw/day	0,053	PROC5, PROC8a
Worker, long-term, systemic	Inhalation	4,422 mg/m3	0,867	PROC4, PROC5, PROC9, PROC15
Worker, long-term, systemic	Combined routes	N/A	0,92	PROC5
Worker, acute, systemic	Inhalation	35,37 mg/m3	0,347	PROC8a
Worker, acute, systemic	Combined routes	N/A	0,347	PROC8a

Environment

Information for contributing scenario (2): ERC6a
 Assessment method: CHESAR V2.1.
 Exposure estimation:

Compartment	PEC	RCR	Notes
Freshwater	0,005 mg/L	0,288	
Freshwater sediment	3,074 mg/kg dw	0,288	
Marine water	0,000483 mg/L	0,288	
Marine water sediment	0,306 mg/kg dw	0,286	
Soil	1,132 mg/kg dw	0,534	
STP	0,046 mg/L	<0,01	
Man via environment	0,0009593 mg/m3 / 0,021 mg/kg bw/day	<0,01 / 0,052	Inhalation / Oral
Man via environment-Combined routes	N/A	0,053	

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

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

Health: Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Indoor use, LEV used, with gloves, no respirator required. Duration: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8b, PROC9, PROC15: <8 hours/day. PROC8a: <1 hour/day. 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**1. Exposure scenario (2)****Short title of the exposure scenario:**

Formulation

List of use descriptors:

Product category (PC): PC3, PC8, PC23, PC28, PC29, PC30, PC31, PC32, PC34, PC35, PC39

Process category (PROC): PROC1, PROC2, PROC3, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15

Environmental release category (ERC): ERC2

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.

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 laboratory (< 1 l or 1 kg present at workplace).

Name of contributing environmental scenario and corresponding ERCs:

ERC2 Formulation into mixture.

Further explanations:

PC3 Air care products.

PC8 Biocidal products.

PC23 Leather treatment products.

PC28 Perfumes, fragrances.

PC29 Pharmaceuticals.

PC30 Photo-chemicals.

PC31 Polishes and wax blends.

PC32 Polymer preparations and compounds.

PC34 Textile dyes, and impregnating products.

PC35 Washing and cleaning products.

PC39 Cosmetics, personal care products.

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

2. Conditions of use affecting exposure**2.1 Control of workers exposure**

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

Product characteristics: Concentration of substance: Up to 100%.
Physical state: liquid.
Vapour pressure: 0,0305 Pa at 25 °C

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

Frequency and duration of use/exposure:	Duration: - PROC1, PROC2, PROC3, PROC5, PROC8b, PROC9, PROC14, PROC15: <8 hours/day. - PROC8a: <1 hour/day.
Human factors not influenced by risk management:	Exposed skin surface: - PROC1, PROC3, PROC15: 240 cm ² (one hand, face side only). - PROC2, PROC5, PROC9, PROC14: 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. Process temperature (for liquid): ≤ 40 °C. Assessment tool used: ECETOC TRA Worker v3 for inhalation and dermal exposure.
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. - PROC3: Closed batch process with occasional controlled exposure. - PROC8b, PROC9: Semi-closed process with occasional controlled exposure. - PROC5, PROC8a, PROC14, PROC15: No. Local exhaust ventilation: - PROC1: Not required. - PROC2, PROC3, PROC5, PROC8a, PROC9, PROC14, PROC15: Yes (90% effectiveness). - PROC8b: Yes (95% effectiveness). Local exhaust ventilation (for dermal): - PROC1: Not required. - PROC2, PROC3, PROC5, PROC8a, PROC9, PROC14, PROC15: Yes (90% effectiveness). - PROC8b: 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: Yes (chemically resistant gloves conforming to EN374 with basic employee training) (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. For tasks where potential splashes may arise, the following personal protective equipment is recommended: face shield, substance/task appropriate gloves and full skin coverage with appropriate light-weight barrier materials (e.g. coveralls).
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: 0,0305 Pa at 25 °C
Amounts used:	Maximum daily use at a site: 1 ton/day. Maximum annual use at a site: 100 tons/year. Percentage of tonnage used at regional scale: 100 %.
Frequency and duration of use:	Emission days: 100 days/year.
Environmental factors not influenced by risk management:	Flow rate of receiving surface water: ≥18,000 m ³ /day (default).

Other given operational conditions affecting environmental exposure:	Indoor use. Industrial use. Release fraction to air from process (initial release): 0.025; (final release): 0.025. Local release rate: 25 kg/day. Release fraction to wastewater from process (initial release): 0.02; (final release): 0.001. Local release rate: 1 kg/day. Release fraction to soil from process (final release): 0,0001.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil:	Dry sludge application to agricultural soil: Yes (default). On-site treatment of wastewater: Removal of 95% of substance through 1) Organic phase separation and distillation of collected process and equipment cleaning water followed by organic phase incineration or 2) incineration of all collected process and equipment cleaning water (Effectiveness Water: 95%).
Conditions and measures related to municipal sewage treatment plant:	Municipal Sewage Treatment Plant (STP): Yes (Efficiency=90,9%). Size of municipal sewage system/treatment plant: >=2000 m3/day (standard town).
Conditions and measures related to external treatment of waste for disposal:	Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)
Conditions and measures related to external recovery of waste:	External recovery and recycling of waste should comply with applicable local and/or national regulations.
Additional good practice advice. 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

Health

Information for contributing scenario (1): PROC5, PROC8a, PROC9, PROC14, PROC15

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

Exposure estimation:

	<u>Route</u>	<u>Exposure estimate</u>	<u>RCR</u>	<u>Notes</u>
Worker, long-term, systemic	Dermal	0,137 mg/kg bw/day	0,053	PROC5, PROC8a
Worker, long-term, systemic	Inhalation	4,422 mg/m3	0,867	PROC5, PROC9, PROC14, PROC15
Worker, long-term, systemic	Combined routes	N/A	0,92	PROC5
Worker, acute, systemic	Inhalation	35,37 mg/m3	0,347	PROC8a
Worker, acute, systemic	Combined routes	N/A	0,347	PROC8a

Environment

Information for contributing scenario (2): ERC2

Assessment method: CHESAR V2.1.

Exposure estimation:

<u>Compartment</u>	<u>PEC</u>	<u>RCR</u>	<u>Notes</u>
Freshwater	0,005 mg/L	0,288	
Freshwater sediment	3,074 mg/kg dw	0,288	
Marine water	0,000483 mg/L	0,288	
Marine water sediment	0,306 mg/kg dw	0,286	
Soil	1,135 mg/kg dw	0,535	
STP	0,046 mg/L	<0,01	
Man via environment	0,002 mg/m3 / 0,038 mg/kg bw/day	<0,01 / 0,094	Inhalation / Oral
Man via environment-Combined routes	N/A	0,096	

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

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

Health: Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Indoor use, LEV used, with gloves, no respirator required. Duration: PROC1, PROC2, PROC3, PROC5, PROC8b, PROC9, PROC14, PROC15: <8 hours/day. PROC8a: <1 hour/day. 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.
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Exposure scenario (3): Use at industrial sites - Industrial use of washing and cleaning products

1. Exposure scenario (3)

Short title of the exposure scenario:

Use at industrial sites - Industrial 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, PROC8a, PROC8b, PROC9, 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.

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.

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:

PC35 Washing and cleaning products.

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

2. Conditions of use affecting exposure

2.1 Control of workers exposure

General:	Generally accepted standards of occupational hygiene are maintained. Smoking, eating and drinking are prohibited at the workplace. Spills are cleaned immediately. Local exhaust ventilation and gloves are considered.
Product characteristics:	Concentration of substance: - PROC1, PROC2, PROC4, PROC8a, PROC8b, PROC9, PROC13: 5-25%. - PROC7, PROC10: 1-5%. Physical state: liquid. Vapour pressure: 0,0305 Pa at 25 °C
Amounts used:	This information is not relevant for assessment of worker's exposure.
Frequency and duration of use/exposure:	Duration: - PROC1, PROC2, PROC4, PROC8b, PROC9: <8 hours/day. - PROC8a, PROC10, PROC13: <4 hours/day. - PROC7: <1 hour/day.
Human factors not influenced by risk management:	Exposed skin surface: - PROC1: 240 cm ² (one hand, face side only). - PROC2, PROC4, PROC9, PROC13: 480 cm ² (two hands, face side only). - PROC8a, PROC8b, PROC10: 960 cm ² (two hands). - PROC7: 1500 cm ² (two hands and upper wrists).
Other given operational conditions affecting workers exposure:	Location: Indoor use. Domain: Industrial use. Process temperature (for liquid): ≤ 40 °C. Assessment tool used: ECETOC TRA Worker v3 for inhalation and dermal exposure.

Technical conditions and measures to control dispersion from source towards the worker:	<p>General ventilation: Basic general ventilation (1-3 air changes per hour): 0%.</p> <p>Containment:</p> <ul style="list-style-type: none"> - PROC1: Closed system (minimal contact during routine operations). - PROC2: Closed continuous process with occasional controlled exposure. - PROC4, PROC8b, PROC9: Semi-closed process with occasional controlled exposure. - PROC7, PROC8a, PROC10, PROC13: No. <p>Local exhaust ventilation:</p> <ul style="list-style-type: none"> - PROC1: Not required. - PROC2, PROC4, PROC8a, PROC9, PROC10, PROC13: Yes (90% effectiveness). - PROC7, PROC8b: Yes (95% effectiveness). <p>Local exhaust ventilation (for dermal):</p> <ul style="list-style-type: none"> - PROC1, PROC10: Not required. - PROC2, PROC4, PROC8a, PROC9, PROC13: Yes (90% effectiveness). - PROC7, PROC8b: Yes (95% effectiveness). <p>Occupational Health and Safety Management System: Advanced.</p>
Conditions and measures related to personal protection, hygiene and health evaluation:	<p>Respiratory protection: Not required.</p> <p>Dermal protection: Yes (chemically resistant gloves conforming to EN374 with basic employee training) (minimum efficiency dermal: 90%).</p>
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply:	<p>Generally accepted standards of occupational hygiene are maintained.</p> <p>Minimisation of manual phases/work tasks.</p> <p>Minimisation of splashes and spills.</p> <p>Avoidance of contact with contaminated tools and objects.</p> <p>Regular cleaning of equipment and work area.</p> <p>Training staff on good practice.</p> <p>Management/supervision in place to check that RMMs in place are being used correctly and OCs followed.</p> <p>For tasks where potential splashes may arise, the following personal protective equipment is recommended: face shield, substance/task appropriate gloves and full skin coverage with appropriate light-weight barrier materials (e.g. coveralls).</p>
2.2 Control of environmental exposure	
General:	<p>All risk management measures utilised must also comply with all relevant local regulations.</p> <p>Fraction of the main local source: 0,005. Emission days: 300 days/year.</p>
Product characteristics:	<p>Physical state: liquid.</p> <p>Vapour pressure: 0,0305 Pa at 25 °C</p>
Amounts used:	<p>Maximum daily use at a site: 0,002 ton/day.</p> <p>Maximum annual use at a site: 0,5 tons/year.</p> <p>Fraction of the main local source: 0,005.</p> <p>Percentage of tonnage used at regional scale: 100 %.</p>
Frequency and duration of use:	<p>Emission days: 300 days/year.</p>
Environmental factors not influenced by risk management:	<p>Flow rate of receiving surface water: >=18,000 m3/day (default).</p>
Other given operational conditions affecting environmental exposure:	<p>Indoor use.</p> <p>Industrial use.</p> <p>Release fraction to air from process (initial release):1,00; (final release): 1,00. Local release rate: 1,66 kg/day.</p> <p>Release fraction to wastewater from process (initial release): 1,00; (final release): 1,00. Local release rate: 1,66 kg/day.</p> <p>Release fraction to soil from process (final release): 0,05.</p>
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil:	<p>Dry sludge application to agricultural soil: Yes (default).</p>
Conditions and measures related to municipal sewage treatment plant:	<p>Municipal Sewage Treatment Plant (STP): Yes (Efficiency=90,9%).</p> <p>Size of municipal sewage system/treatment plant: >=2000 m3/day (standard town).</p>
Conditions and measures related to external treatment of waste for disposal:	<p>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.)</p>
Conditions and measures related to external recovery of waste:	<p>External recovery and recycling of waste should comply with applicable local and/or national regulations.</p>

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

Health

Information for contributing scenario (1): PROC7, PROC8a, PROC10, PROC13

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

Exposure estimation:

	<u>Route</u>	<u>Exposure estimate</u>	<u>RCR</u>	<u>Notes</u>
Worker, long-term, systemic	Dermal	0,549 mg/kg bw/day	0,211	PROC10
Worker, long-term, systemic	Inhalation	3,184 mg/m3	0,624	PROC8a, PROC13
Worker, long-term, systemic	Combined routes	N/A	0,656	PROC8a, PROC13
Worker, acute, systemic	Inhalation	35,37 mg/m3	0,347	PROC7
Worker, acute, systemic	Combined routes	N/A	0,347	PROC7

Environment

Information for contributing scenario (2): ERC4

Assessment method: CHESAR V2.1.

Exposure estimation:

<u>Compartment</u>	<u>PEC</u>	<u>RCR</u>	<u>Notes</u>
Freshwater	0,008 mg/L	0,466	
Freshwater sediment	4,963 mg/kg dw	0,466	
Marine water	0,0007806 mg/L	0,465	
Marine water sediment	0,495 mg/kg dw	0,463	
Soil	1,875 mg/kg dw	0,885	
STP	0,076 mg/L	<0,01	
Man via environment	0,0003881 mg/m3 / 0,015 mg/kg bw/day	<0,01 / 0,039	Inhalation / Oral
Man via environment-Combined routes	N/A	0,039	

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

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

Health:

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Indoor use, LEV used, with gloves, no respirator required. Duration: PROC1, PROC2, PROC4, PROC8b, PROC9: <8 hours/day. PROC8a, PROC10, PROC13: <4 hours/day. PROC7: <1 hour/day. Concentration of substance: PROC1, PROC2, PROC4, PROC8a, PROC8b, PROC9, PROC13: 5-25%. PROC7, PROC10: 1-5%.

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 manufacture of textiles, leather and fur

1. Exposure scenario (4)

Short title of the exposure scenario:

Use at industrial sites - Industrial manufacture of textiles, leather and fur

List of use descriptors:

Sector of use category (SU): SU5

Product category (PC): PC34

Process category (PROC): PROC5, PROC8a, PROC8b, PROC9, PROC13.

Environmental release category (ERC): ERC4

List of names of contributing worker scenarios and corresponding PROCs:

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.

SDS Name: Kalama* Benzyl Benzoate USP/FCC

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.
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:

PC34 Textile dyes, and impregnating products.

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

2. Conditions of use affecting exposure

2.1 Control of workers exposure

General:	Generally accepted standards of occupational hygiene are maintained. Smoking, eating and drinking are prohibited at the workplace. Spills are cleaned immediately. Local exhaust ventilation and gloves are considered.
Product characteristics:	Concentration of substance: Up to 100%. Physical state: liquid. Vapour pressure: 0,0305 Pa at 25 °C
Amounts used:	This information is not relevant for assessment of worker's exposure.
Frequency and duration of use/exposure:	Duration: - PROC5, PROC8b, PROC9: <8 hours/day. - PROC8a, PROC13: <1 hour/day.
Human factors not influenced by risk management:	Exposed skin surface: - PROC5, PROC9, PROC13: 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. Process temperature (for liquid): <= 40 °C. Assessment tool used: ECETOC TRA Worker v3 for inhalation and dermal exposure.
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: - PROC8b, PROC9: Semi-closed process with occasional controlled exposure. - PROC5, PROC8a, PROC13: No. Local exhaust ventilation: - PROC5, PROC8a, PROC9, PROC13: Yes (90% effectiveness). - PROC8b: Yes (95% effectiveness). Local exhaust ventilation (for dermal): - PROC5, PROC8a, PROC9, PROC13: Yes (90% effectiveness). - PROC8b: 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: Yes (chemically resistant gloves conforming to EN374 with basic employee training) (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. For tasks where potential splashes may arise, the following personal protective equipment is recommended: face shield, substance/task appropriate gloves and full skin coverage with appropriate light-weight barrier materials (e.g. coveralls).
2.2 Control of environmental exposure	
General:	All risk management measures utilised must also comply with all relevant local regulations. Emission days: 300 days/year. Maximum annual use at a site: 75 tons/year. Treat air emission to provide a typical removal efficiency of 95%. Safe use can be demonstrated when emission to receiving waters is <=1,5 kg/day.

Product characteristics:	Physical state: liquid. Vapour pressure: 0,0305 Pa at 25 °C
Amounts used:	Maximum daily use at a site: 0,25 ton/day. Maximum annual use at a site: 75 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. Indoor use. Release fraction to air from process (initial release): 1,00; (final release): 0.05. Local release rate: 12,5 kg/day. Release fraction to wastewater from process (final release): 0,006. Local release rate: 1,5 kg/day. Release fraction to soil from process (final release): 0,05.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil:	Dry sludge application to agricultural soil: Yes (default). Treat air emission to provide a typical removal efficiency of 95%. Technical options to treat air emissions and stack gas removal: carbon tower adsorption or waste gas incineration.
Conditions and measures related to municipal sewage treatment plant:	Municipal Sewage Treatment Plant (STP): Yes (Efficiency=90,9%). Size of municipal sewage system/treatment plant: >=2000 m3/day (standard town).
Conditions and measures related to external treatment of waste for disposal:	Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)
Conditions and measures related to external recovery of waste:	External recovery and recycling of waste should comply with applicable local and/or national regulations.
Additional good practice advice. 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

Health

Information for contributing scenario (1): PROC5, PROC8a, PROC9, PROC13
 Assessment method: ECETOC TRA Worker v3. Only highest figures are presented here.
 Exposure estimation:

	<u>Route</u>	<u>Exposure estimate</u>	<u>RCR</u>	<u>Notes</u>
Worker, long-term, systemic	Dermal	0,137 mg/kg bw/day	0,053	PROC5, PROC8a, PROC13
Worker, long-term, systemic	Inhalation	4,422 mg/m3	0,867	PROC5, PROC9
Worker, long-term, systemic	Combined routes	N/A	0,92	PROC5
Worker, acute, systemic	Inhalation	35,37 mg/m3	0,347	PROC8a, PROC13
Worker, acute, systemic	Combined routes	N/A	0,347	PROC8a, PROC13

Environment

Information for contributing scenario (2): ERC4
 Assessment method: CHESAR V2.1.
 Exposure estimation:

<u>Compartment</u>	<u>PEC</u>	<u>RCR</u>	<u>Notes</u>
Freshwater	0,007 mg/L	0,423	
Freshwater sediment	4,505 mg/kg dw	0,423	
Marine water	0,0007084 mg/L	0,422	
Marine water sediment	0,45 mg/kg dw	0,42	
Soil	1,701 mg/kg dw	0,802	
STP	0,068 mg/L	<0,01	
Man via environment	0,003 mg/m3 / 0,057 mg/kg bw/day	<0,01 /0,144	Inhalation / Oral
Man via environment-Combined routes	N/A	0,146	

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

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

Health: Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Indoor use, LEV used, with gloves, no respirator required. Duration: PROC5, PROC8b, PROC9: <8 hours/day. PROC8a, PROC13: <1 hour/day. 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 (5): Use at industrial sites - Use as processing aid**1. Exposure scenario (5)****Short title of the exposure scenario:**

Use at industrial sites - Use as processing aid

List of use descriptors:

Sector of use category (SU): SU9, SU12

Product category (PC): PC3, PC9a, PC21, PC28, PC31, PC32, PC35, PC39

Process category (PROC): PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15

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.

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

PROC4 Chemical production where opportunity for exposure arises.

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

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

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

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:

PC3 Air care products.

PC35 Washing and cleaning products.

PC9a Coatings and paints, thinners, paint removers.

PC21 Laboratory chemicals.

PC28 Perfumes, fragrances.

PC31 Polishes and wax blends.

PC32 Polymer preparations and compounds.

PC39 Cosmetics, personal care products.

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

2. Conditions of use affecting exposure**2.1 Control of workers exposure**

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

Product characteristics: Concentration of substance: Up to 100%.
Physical state: liquid.
Vapour pressure: 0,0305 Pa at 25 °C

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

Frequency and duration of use/exposure: Duration:
- PROC1, PROC2, PROC3, PROC4, PROC8b, PROC9, PROC15: <8 hours/day.
- PROC8a: <1 hour/day.

Human factors not influenced by risk management:	Exposed skin surface: - PROC1, PROC3, PROC15: 240 cm ² (one hand, face side only). - PROC2, PROC4, 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. Process temperature (for liquid): ≤ 40 °C. Assessment tool used: ECETOC TRA Worker v3 for inhalation and dermal exposure.
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. - PROC3: Closed batch process with occasional controlled exposure. - PROC4, PROC8b, PROC9: Semi-closed process with occasional controlled exposure. - PROC8a, PROC15: No. Local exhaust ventilation: - PROC1: Not required. - PROC2, PROC3, PROC4, PROC8a, PROC9, PROC15: Yes (90% effectiveness). - PROC8b: Yes (95% effectiveness). Local exhaust ventilation (for dermal): - PROC1: Not required. - PROC2, PROC3, PROC4, PROC8a, PROC9, PROC15: Yes (90% effectiveness). - PROC8b: 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: Yes (chemically resistant gloves conforming to EN374 with basic employee training) (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. For tasks where potential splashes may arise, the following personal protective equipment is recommended: face shield, substance/task appropriate gloves and full skin coverage with appropriate light-weight barrier materials (e.g. coveralls).
2.2 Control of environmental exposure	
General:	All risk management measures utilised must also comply with all relevant local regulations. Emission days: 300 days/year. Maximum annual use at a site: 75 tons/year. Treat air emission to provide a typical removal efficiency of 95%. Safe use can be demonstrated when emission to receiving waters is ≤ 1,5 kg/day.
Product characteristics:	Physical state: liquid. Vapour pressure: 0,0305 Pa at 25 °C
Amounts used:	Maximum daily use at a site: 2,5 ton/day. Maximum annual use at a site: 75 tons/year. Percentage of tonnage used at regional scale: 100 %.
Frequency and duration of use:	Emission days: 30 days/year.
Environmental factors not influenced by risk management:	Flow rate of receiving surface water: ≥ 18,000 m ³ /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): 0,05. Local release rate: 125 kg/day. Release fraction to wastewater from process (final release): 0,0006. Local release rate: 1,5 kg/day. Release fraction to soil from process (final release): 0,05.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil: Dry sludge application to agricultural soil: Yes (default).
Treat air emission to provide a typical removal efficiency of 95%.
Technical options to treat air emissions and stack gas removal: carbon tower adsorption or waste gas incineration.

Conditions and measures related to municipal sewage treatment plant: Municipal Sewage Treatment Plant (STP): Yes (Efficiency=90,9%).
Size of municipal sewage system/treatment plant: >=2000 m3/day (standard town).

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

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

Additional good practice advice. 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

Health

Information for contributing scenario (1): PROC4, PROC8a, PROC9, PROC15

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

Exposure estimation:

	<u>Route</u>	<u>Exposure estimate</u>	<u>RCR</u>	<u>Notes</u>
Worker, long-term, systemic	Dermal	0,137 mg/kg bw/day	0,053	PROC8a
Worker, long-term, systemic	Inhalation	4,422 mg/m3	0,867	PROC4, PROC9, PROC15
Worker, long-term, systemic	Combined routes	N/A	0,893	PROC4, PROC9
Worker, acute, systemic	Inhalation	35,37 mg/m3	0,347	PROC8a
Worker, acute, systemic	Combined routes	N/A	0,347	PROC8a

Environment

Information for contributing scenario (2): ERC4

Assessment method: CHESAR V2.1.

Exposure estimation:

<u>Compartment</u>	<u>PEC</u>	<u>RCR</u>	<u>Notes</u>
Freshwater	0,007 mg/L	0,423	
Freshwater sediment	4,505 mg/kg dw	0,423	
Marine water	0,0007084 mg/L	0,422	
Marine water sediment	0,45 mg/kg dw	0,42	
Soil	1,701 mg/kg dw	0,802	
STP	0,068 mg/L	<0,01	
Man via environment	0,003 mg/m3 / 0,056 mg/kg bw/day	<0,01 / 0,14	Inhalation / Oral
Man via environment-Combined routes	N/A	0,142	

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

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

Health: Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Indoor use, LEV used, with gloves, no respirator required. Duration: PROC1, PROC2, PROC3, PROC4, PROC8b, PROC9, PROC15: <8 hours/day. PROC8a: <1 hour/day. 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 (6): Use by professional workers - Professional use of washing and cleaning products

1. Exposure scenario (6)

Short title of the exposure scenario:

Use by professional workers - Professional 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, ERC8d

List of names of contributing worker scenarios and corresponding PROCs:

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

PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.

PROC4 Chemical production where opportunity for exposure arises.

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

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

PROC10 Roller application or brushing. This includes application of paints, coatings, removers, adhesives or cleaning agents to surfaces with potential exposure arising from splashes.

PROC11 Non industrial spraying. Air dispersive techniques i.e. dispersion into air (= atomization) by e.g. pressurized air, hydraulic pressure or centrifugation, applicable for liquids and powders.

PROC13 Treatment of articles by dipping and pouring.

Name of contributing environmental scenario and corresponding ERCs:

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

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

Further explanations:

PC35 Washing and cleaning products.

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

2. Conditions of use affecting exposure

2.1 Control of workers exposure

General:	Generally accepted standards of occupational hygiene are maintained. Smoking, eating and drinking are prohibited at the workplace. Spills are cleaned immediately. Gloves are considered. Respiratory protection: PROC10, PROC11: Yes (Respirator with APF of 10) (Effectiveness Inhalation: 90%).
Product characteristics:	Concentration of substance: - PROC1: 5-25%. - PROC2, PROC4, PROC8a, PROC8b, PROC10, PROC13: 1-5%. - PROC11: <1%. Physical state: liquid. Vapour pressure: 0,0305 Pa at 25 °C Viscosity: Liquids with medium viscosity.
Amounts used:	Application rate (for inhalation exposure): PROC8a: 1-10 L/minute.
Frequency and duration of use/exposure:	Duration: - PROC1: <8 hours/day. - PROC10: <4 hours/day. - PROC2, PROC4, PROC8a, PROC8b, PROC11, PROC13: <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: - PROC1, PROC2, PROC4: Indoor use. - PROC8a, PROC8b, PROC10, PROC11, PROC13: Indoor/outdoor use. Domain: Professional use. Process temperature (for liquid): - PROC1, PROC2, PROC4, PROC8a (dermal exposure), PROC8b, PROC10, PROC11, PROC13: <=40°C. - PROC8a (inhalation exposure): 15-25 °C. Assessment tool used: - PROC1, PROC2, PROC4, PROC8b, PROC10, PROC11, PROC13: ECETOC TRA Worker v3 for inhalation and dermal exposure. - PROC8a: ECETOC TRA Worker v3 for dermal exposures. Advanced REACH Tool (ART v1.5) for inhalation exposure.

Technical conditions and measures at process level (source) to prevent release:	Activity class - subclass (ART v1.5): PROC8a: Transfer of liquid products - falling liquids. Containment: open process - splash loading. Process not fully enclosed but demonstrable and effective housekeeping practices in place.
Technical conditions and measures to control dispersion from source towards the worker:	General ventilation: Basic general ventilation (1-3 air changes per hour): 0% (indoor use). Outdoors (outdoor use). Containment: - PROC1: Closed system (minimal contact during routine operations). - PROC2: Closed continuous process with occasional controlled exposure. - PROC4, PROC8b: Semi-closed process with occasional controlled exposure. - PROC8a, PROC10, PROC11, PROC13: No. Local exhaust ventilation: Not required. Local exhaust ventilation (for dermal): Not required. Occupational Health and Safety Management System: Basic.
Conditions and measures related to personal protection, hygiene and health evaluation:	Respiratory protection: - PROC1, PROC2, PROC4, PROC8a, PROC8b, PROC13: Not required. - PROC10, PROC11: Yes (Respirator with APF of 10) (Effectiveness Inhalation: 90%). Dermal protection: Yes (chemically resistant gloves conforming to EN374 with basic employee training) (minimum efficiency dermal: 90%).
Additional good practice advice. 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. For tasks where potential splashes may arise, the following personal protective equipment is recommended: face shield, substance/task appropriate gloves and full skin coverage with appropriate light-weight barrier materials (e.g. coveralls).
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: 0,0305 Pa at 25 °C
Amounts used:	Daily wide dispersive use: 0,000033 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. Indoor/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: 0,033 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=90,9%). Size of municipal sewage system/treatment plant: >=2000 m3/day (standard town).
Conditions and measures related to external treatment of waste for disposal:	Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)
Conditions and measures related to external recovery of waste:	External recovery and recycling of waste should comply with applicable local and/or national regulations.
Additional good practice advice. 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	
Health	

SDS Name: Kalama* Benzyl Benzoate USP/FCC

Information for contributing scenario (1): PROC4, PROC8b, PROC11, PROC13

Assessment method: PROC1, PROC2, PROC4, PROC8b, PROC10, PROC11, PROC13: ECETOC TRA v3. PROC8a: ECETOC TRA v3 for dermal exposures. Advanced REACH Tool (ART v1.5) for inhalation exposure. Only highest figures are presented here.

Exposure estimation:

	<u>Route</u>	<u>Exposure estimate</u>	<u>RCR</u>	<u>Notes</u>
Worker, long-term, systemic	Dermal	1,071 mg/kg bw/day	0,412	PROC11
Worker, long-term, systemic	Inhalation	3,537 mg/m3	0,694	PROC4, PROC8b (indoors), PROC13 (indoors)
Worker, long-term, systemic	Combined routes	N/A	0,799	PROC8b (indoors), PROC13 (indoors)
Worker, acute, systemic	Inhalation	70,75 mg/m3	0,694	PROC4, PROC8b (indoors), PROC13 (indoors)
Worker, acute, systemic	Combined routes	N/A	0,694	PROC4, PROC8b (indoors), PROC13 (indoors)

Environment

Information for contributing scenario (2): ERC8d

Assessment method: CHESAR V2.1.

Exposure estimation:

<u>Compartment</u>	<u>PEC</u>	<u>RCR</u>	<u>Notes</u>
Freshwater	0,0004839 mg/L	0,029	ERC8d
Freshwater sediment	0,307 mg/kg dw	0,029	ERC8d
Marine water	0,0000469 mg/L	0,028	ERC8d
Marine water sediment	0,03 mg/kg dw	0,028	ERC8d
Soil	0,04 mg/kg dw	0,019	ERC8d
STP	0,002 mg/L	<0,01	ERC8d
Man via environment	0,000007276 mg/m3 / 0,0004288 mg/kg bw/day	<0,01 / <0,01	Inhalation / Oral (ERC8d)
Man via environment-Combined routes	N/A	<0,01	ERC8d

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

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

Health: Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Indoor/outdoor use, without LEV, with gloves. Duration: PROC1: <8 hours/day. PROC10: <4 hours/day. PROC2, PROC4, PROC8a, PROC8b, PROC11, PROC13: <1 hour/day. Respiratory protection: PROC1, PROC2, PROC4, PROC8a, PROC8b, PROC13: Not required. PROC10, PROC11: Yes (Respirator with APF of 10) (Effectiveness Inhalation: 90%). Concentration of substance: PROC1: 5-25%. PROC2, PROC4, PROC8a, PROC8b, PROC10, PROC13: 1-5%. PROC11: <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 (7): Use by professional workers - Professional use of polishes and wax blends

1. Exposure scenario (7)

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
- Product category (PC): PC31
- Process category (PROC): PROC2, PROC8a, PROC8b, PROC10, PROC11.
- Environmental release category (ERC): ERC8a, ERC8d

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).

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

Further explanations:

PC31 Polishes and wax blends.

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. Gloves are considered. Respiratory protection: PROC10, PROC11: Yes (Respirator with APF of 10) (Effectiveness Inhalation: 90%).
Product characteristics:	Concentration of substance: - PROC2, PROC8a, PROC8b, PROC10: 1-5%. - PROC11: <1%. Physical state: liquid. Vapour pressure: 0,0305 Pa at 25 °C Viscosity: Liquids with medium viscosity.
Amounts used:	Application rate (for inhalation exposure): PROC8a: 1-10 L/minute.
Frequency and duration of use/exposure:	Duration: - PROC10: <4 hours/day. - PROC2, PROC8a, PROC8b, PROC11: <1 hour/day.
Human factors not influenced by risk management:	Exposed skin surface: - PROC2: 480 cm ² (two hands, face side only). - PROC8a, PROC8b, PROC10: 960 cm ² (two hands). - PROC11: 1500 cm ² (two hands and upper wrists).
Other given operational conditions affecting workers exposure:	Location: - PROC2: Indoor use. - PROC8a, PROC8b, PROC10, PROC11: Indoor/outdoor use. Domain: Professional use. Process temperature (for liquid): - PROC2, PROC8a (dermal exposure), PROC8b, PROC10, PROC11: <=40°C. - PROC8a (inhalation exposure): 15-25 °C. Assessment tool used: - PROC2, PROC8b, PROC10, PROC11: ECETOC TRA Worker v3 for inhalation and dermal exposure. - PROC8a: ECETOC TRA Worker v3 for dermal exposures. Advanced REACH Tool (ART v1.5) for inhalation exposure.
Technical conditions and measures at process level (source) to prevent release:	Activity class - subclass (ART v1.5): PROC8a: Transfer of liquid products - falling liquids. Containment: open process - splash loading. Process not fully enclosed but demonstrable and effective housekeeping practices in place.
Technical conditions and measures to control dispersion from source towards the worker:	General ventilation: Basic general ventilation (1-3 air changes per hour): 0% (indoor use). Outdoors (outdoor use). 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. Local exhaust ventilation (for dermal): Not required. Occupational Health and Safety Management System: Basic.

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

Respiratory protection:
 - PROC2, PROC8a, PROC8b: Not required.
 - PROC10, PROC11: Yes (Respirator with APF of 10) (Effectiveness Inhalation: 90%).
 Dermal protection: Yes (chemically resistant gloves conforming to EN374 with basic employee training) (minimum efficiency dermal: 90%).

Additional good practice advice. 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.
 For tasks where potential splashes may arise, the following personal protective equipment is recommended: face shield, substance/task appropriate gloves and full skin coverage with appropriate light-weight barrier materials (e.g. coveralls).

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: 0,0305 Pa at 25 °C
Amounts used:	Daily wide dispersive use: 0,000033 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. Indoor/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: 0,033 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=90,9%). Size of municipal sewage system/treatment plant: >=2000 m3/day (standard town).
Conditions and measures related to external treatment of waste for disposal:	Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)
Conditions and measures related to external recovery of waste:	External recovery and recycling of waste should comply with applicable local and/or national regulations.
Additional good practice advice. 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

Health

Information for contributing scenario (1): PROC8b, PROC11

Assessment method: PROC2, PROC8b, PROC10, PROC11: ECETOC TRA v3. PROC8a: ECETOC TRA v3 for dermal exposures. Advanced REACH Tool (ART v1.5) for inhalation exposure. Only highest figures are presented here.

Exposure estimation:

	Route	Exposure estimate	RCR	Notes
Worker, long-term, systemic	Dermal	1,071 mg/kg bw/day	0,412	PROC11
Worker, long-term, systemic	Inhalation	3,537 mg/m3	0,694	PROC8b (indoors)
Worker, long-term, systemic	Combined routes	N/A	0,799	PROC8b (indoors)
Worker, acute, systemic	Inhalation	70,75 mg/m3	0,694	PROC8b (indoors)
Worker, acute, systemic	Combined routes	N/A	0,694	PROC8b (indoors)

Environment

Information for contributing scenario (2): ERC8d

SDS Name: Kalama* Benzyl Benzoate USP/FCC

Assessment method: CHESAR V2.1.

Exposure estimation:

Compartment	PEC	RCR	Notes
Freshwater	0004839 mg/L	0,029	ERC8d
Freshwater sediment	0,307 mg/kg dw	0,029	ERC8d
Marine water	0,0000469 mg/L	0,028	ERC8d
Marine water sediment	0,03 mg/kg dw	0,028	ERC8d
Soil	0,04 mg/kg dw	0,019	ERC8d
STP	0,002 mg/L	<0,01	ERC8d
Man via environment	0,000007276 mg/m3 / 0,0004288 mg/kg bw/day	<0,01 / <0,01	Inhalation / Oral (ERC8d)
Man via environment-Combined routes	N/A	<0,01	ERC8d

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

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

Health:	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Indoor/outdoor use, without LEV, with gloves. Duration: PROC10: <4 hours/day. PROC2, PROC8a, PROC8b, PROC11: <1 hour/day. Concentration of substance: PROC2, PROC8a, PROC8b, PROC10: 1-5%. PROC11: <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 (8): Use by professional workers - Professional end-use of cosmetics

1. Exposure scenario (8)

Short title of the exposure scenario:

Use by professional workers - Professional end-use of cosmetics

List of use descriptors:

Sector of use category (SU): SU0

Product category (PC): PC28, PC39

Environmental release category (ERC): ERC8a

Name of contributing environmental scenario and corresponding ERCs:

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

Further explanations:

PC28 Perfumes, fragrances.

PC39 Cosmetics, personal care products.

For 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.
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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: 0,0305 Pa at 25 °C
Amounts used:	Daily wide dispersive use: 0.0000055 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.
 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: 0.006 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=90,9%).
 Size of municipal sewage system/treatment plant: >=2000 m3/day (standard town).

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

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

Conditions and measures related to external recovery of waste:

External recovery and recycling of waste should comply with applicable local and/or national regulations.

Additional good practice advice. 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

Environment

Information for contributing scenario (2): ERC8a

Assessment method: CHESAR V2.1.

Exposure estimation:

Compartment	PEC	RCR	Notes
Freshwater	0,0003598 mg/L	0,021	
Freshwater sediment	0,228 mg/kg dw	0,021	
Marine water	0,0000345 mg/L	0,021	
Marine water sediment	0,022 mg/kg dw	0,02	
Soil	0,009 mg/kg dw	<0,01	
STP	0,0002504 mg/L	<0,01	
Man via environment	0,000007273 mg/m3 / 0,000282 mg/kg bw/day	<0,01 / <0,01	Inhalation / Oral
Man 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 (9): Consumer use - Consumer end-use of washing and cleaning products

1. Exposure scenario (9)

Short title of the exposure scenario:

Consumer use - Consumer end-use of washing and cleaning products

List of use descriptors:

Product category (PC): PC35
 Environmental release category (ERC): ERC8a, ERC8d

Name of contributing environmental scenario and corresponding ERCs:

ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor).
 ERC8d Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor).

Further explanations:

- PC35 Washing and cleaning products.
- CS1: Laundry and dishwashing products.
- AISE C1 Laundry regular (powder, liquid).
- AISE C2 Laundry compact (powder, liquid/gel, tablet).
- AISE C3 Fabric conditioners (liquid regular, liquid concentrate).

SDS Name: Kalama* Benzyl Benzoate USP/FCC

- AISE C4 Laundry additives (powder bleach, liquid bleach, tablet).
 - AISE C5 Hand dishwashing (liquid regular, liquid concentrate).
 - AISE C6 Machine dishwashing (powder, liquid, tablet).
 - AISE C12 Laundry aids (ironing aids-starch spray, ironing aids-other).
- CS2: Cleaners, liquids (all-purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners).
- AISE C7 Surface cleaners (liquid, powder, gel neat).
 - AISE C8 Toilet cleaners (powder, liquid, gel, tablet).
 - AISE C11 Carpet cleaners (liquid).
 - AISE C15 Wipes (bathroom, kitchen, floor).
 - AISE C21 High pressure washers/cleaners (liquid).
 - AISE C22 Automotive care (liquid).
- CS3: Cleaners, trigger sprays (all-purpose cleaners, sanitary products, glass cleaners).
- AISE C7 Surface cleaners (spray neat).
 - AISE C10 Oven cleaners (trigger spray).
 - AISE C11 Carpet cleaners (spray).
 - AISE C22 Automotive care (spray).

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

2. Conditions of use affecting exposure

2.1 Control of consumer exposure

Product characteristics:

Concentration of substance (F1 x 100): Unless otherwise stated, covers concentrations up to 3%.

- AISE C12 (spray): up to 2,0%.
- AISE C1 (powder), C2 (powder): up to 1,0%.
- AISE C7 (gel neat), C15, C22 (liquid): up to 0,75%.
- AISE C1 (liquid), C2 (liquid/gel), C4 (powder bleach, liquid bleach): up to 0,70%.
- AISE C7 (spray neat), C10 (trigger spray), C11 (spray), C22 (spray): up to 0,20%.

Physical state: liquid.

Vapour pressure: 0,0305 Pa at 25 °C

Oral contact foreseen: Unless otherwise stated, No.

- AISE C5, C6: Yes.

Spray: Unless otherwise stated, No.

- AISE C7 (spray neat), C10 (trigger spray), C11 (spray), C12 (spray), C22 (spray): Yes.

Amounts used:

Use amounts:

- Total mass sprayed per use (C'): AISE C12 (spray): 20000 mg/task. AISE C7 (spray neat), C10 (trigger spray), C11 (spray), C22 (spray): 35000 mg/task.
- Concentration in wash solution (C): Hand wash-AISE C1, C2, C3, C4: 10 mg/cm³. Pretreatment-AISE C1 (powder), C2 (powder): 600 mg/cm³. Pretreatment-AISE C1 (liquid), C2 (liquid/gel), C4 (liquid bleach): 1000 mg/cm³. Hand dishwashing-AISE C5: 1 mg/cm³. AISE C7 (powder), C8 (powder, tablet): 8 mg/cm³. AISE C7 (liquid), C8 (liquid, gel), C11 (liquid), C22 (liquid): 22 mg/cm³. AISE C7 (gel neat, spray neat), C10 (trigger spray), C11 (spray), C15, C21, C22 (spray): 1000 mg/cm³.
- Amount of undiluted final product used (M): AISE C1 (powder): 290 g. AISE C1 (liquid): 230 g. AISE C2 (powder): 200 g. AISE C2 (liquid/gel), C3 (liquid regular): 140 g. AISE C2 (tablet): 135 g. AISE C3 (liquid concentrate): 90 g. AISE C4 (powder bleach): 70 g. AISE C4 (liquid bleach): 100 g. AISE C4 (tablet): 30 g. AISE C12 (spray): 20 g.
- Concentration in product (oral exposure)(Cp): AISE C5, C6: 1 mg/mL.

Frequency and duration of use/exposure:

Duration covers exposure up to (T): AISE C7 (spray neat), C10 (trigger spray), C11 (spray), C22 (spray): 4 hours/event. AISE C12 (spray): 1 hour/event.

Frequency - covers use frequency (n): Hand wash-AISE C2 (powder), Hand dishwashing-AISE C5: up to 3 times/day. Hand wash-AISE C1 (powder): up to 2,6 times/day. AISE C8, C11 (liquid): up to 2 times/day. Hand wash-AISE C1 (liquid), C2 (liquid/gel, tablet), C3: up to 1,4 times/day. AISE C7, C10 (trigger spray), C11 (spray), C12 (spray), C15, C21, C22: up to 1 time/day. Hand wash-AISE C4: up to 0,6 times/day. Pretreatment-AISE C1 (powder, liquid), C2 (powder, liquid/gel), C4 (liquid bleach): up to 0.5 times/day.

Other given operational conditions affecting consumers exposure:

Location: Indoor/outdoor use.
 Body weight (BW): 60 kg.
 Inhalation exposure model (C"): AISE C7 (spray neat), C10 (trigger spray), C11 (spray), C12 (spray): covers use in room size of 20 m3. AISE C22 (spray): covers use in room size of 34 m3.
 Skin contact area (Sder): Unless otherwise stated, covers skin contact area up to 857,5 cm2.
 - Handwash-AISE C1, C2, C3, C4, C5: up to 2082,5 cm2.
 - Indirect skin contact-AISE C1, C2, C3, C4: up to 14315 cm2.
 - AISE C21, C22 (liquid): up to 875,5 cm2.
 Thickness of product layer in contact with skin (Tder): 0,01 cm.
 Fraction of product layer in contact with skin (F2): Unless otherwise stated, 1. Indirect skin contact-AISE C1, C2, C3, C4, C12 (spray): 0,01.
 Fraction remaining on skin (F3): 1.
 Fraction remaining in final liquor before spinning (fraction) (F'): AISE C1, C2, C3, C4: 0,025.
 Fraction of liquor remaining in final liquor after final spinning (fraction)(FL): AISE C1, C2, C3, C4: 0,6.
 Total fabric weight (W): AISE C1, C2, C3, C4: 3500 g.
 Fabric density (FD): AISE C1, C2, C3, C4: 10 mg/cm2.
 Amount of water left on dishes after rinsing (Ta): AISE C5, C6: 0,000055 mL/cm2.
 Area of dishes in daily contact with food (Sa): AISE C5, C6: 5400 cm2.

Conditions and measures related to information and behavioral advice to consumers:

Assessment tool used: AISE REACT Consumer Tool. Inhalation exposures were assessed for consumer products applied by spraying (AISE C7 (spray neat), C10 (trigger spray), C11 (spray), C12 (spray), C22 (spray)). Dermal exposures from the consumer use of cleaning and washing products included direct skin contact from use and for some uses (AISE C1, C2, C3, C4, C12) indirect skin contact (e.g. wearing washed clothes). Oral exposures from the consumer use of cleaning products included indirect oral exposures to residues on dishes hand-washed or machine-washed (AISE C5, C6).

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: 0,0305 Pa at 25 °C

Amounts used:

Daily wide dispersive use: 0,000011 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/Outdoor use.
 Consumer use.
 Release fraction to air from process (initial release): 1,00; (final release): 1,00.
 Release fraction to wastewater from process (initial release): 1,00; (final release): 1,00.
 Local release rate: 0,011 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=90,9%).
 Size of municipal sewage system/treatment plant: >=2000 m3/day (standard town).

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

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

Conditions and measures related to external recovery of waste:

External recovery and recycling of waste should comply with applicable local and/or national regulations.

Additional good practice advice. 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

Health

Information for contributing scenario (1): AISE C5, C6, C7 (gel neat, spray neat), C12 (spray), C15, C21
 Assessment method: AISE REACT Consumer Tool. Only highest figures are presented here.

Exposure estimation:

	<u>Route</u>	<u>Exposure estimate</u>	<u>RCR</u>	<u>Notes</u>
Consumer, short-term, systemic	Inhalation	20 mg/m3	0,80	AISE C12 (spray)
Consumer, short-term, systemic	Oral	0,000149 mg/kg bw/day	0,0000019	AISE C5, C6
Consumer, short-term, systemic	Combined routes	N/A	0,80	AISE C12 (spray)
Consumer, long-term, systemic	Dermal	1,072 mg/kg bw/day	0,825	AISE C7 (gel neat, spray neat), C15, C21
Consumer, long-term, systemic	Inhalation	0,833 mg/m3	0,667	AISE C12 (spray)
Consumer, long-term, systemic	Oral	0,000149 mg/kg bw/day	0,000371	AISE C5, C6
Consumer, long-term, systemic	Combined routes	N/A	0,825	AISE C7 (gel neat, spray neat), C15, C21

Environment

Information for contributing scenario (2): ERC8d

Assessment method: CHESAR V2.1.

Exposure estimation:

<u>Compartment</u>	<u>PEC</u>	<u>RCR</u>	<u>Notes</u>
Freshwater	0,0003846 mg/L	0,023	ERC8d
Freshwater sediment	0,244 mg/kg dw	0,023	ERC8d
Marine water	0,00003698 mg/L	0,022	ERC8d
Marine water sediment	0,023 mg/kg dw	0,022	ERC8d
Soil	0,015 mg/kg dw	<0,01	ERC8d
STP	0,0005007 mg/L	<0,01	ERC8d
Man via environment	0,000007273 mg/m3 / 0,0003113 mg/kg bw/day	<0,01 / <0,01 (ERC8d)	Inhalation / Oral
Man via environment-Combined routes	N/A	<0,01	ERC8d

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

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

Health:	<p>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. Potential inhalation, dermal and oral exposures to benzyl benzoate arising from consumer use of cleaning and washing products which contain this substance up to 3 % were assessed using the AISE REACT consumer tool using the following modified algorithms to derive consumer use exposures.</p> <ul style="list-style-type: none"> - Inhalation, systemic effects, long-term exposures: $INH_{ext} = (F1 \times C')/C'' \times (T/24)$. Key: INH_{ext}: External inhalation concentration (mg/m³); F1: Ingredient fraction by weight (fraction); C': Total mass sprayed per use (mg/task); C'': Room volume (m³); T: Duration of exposure (hours). - Inhalation, systemic effects, acute exposures: $INH_{ext} = (F1 \times C')/C''$. Key: INH_{ext}: External inhalation concentration (mg/m³); F1: Ingredient fraction by weight (fraction); C': Total mass sprayed per use (mg/task); C'': Room volume (m³). - Dermal, systemic effects, long-term exposures (direct skin contact): $DERM_{sys} = (F1 \times C \times T_{der} \times F2 \times F3 \times S_{der} \times n)/BW$. Key: $DERM_{sys}$: Systemic dose following dermal exposures (mg/kg bw/day); F1: Ingredient fraction by weight (fraction); C: Concentration in wash solution (mg/cm³); T_{der}: Thickness of product layer in contact with skin (cm); F2: Fraction of product layer in contact with skin (cm); F3: Fraction remaining on skin; S_{der}: Surface area exposed skin (cm²); n: Daily frequency of product use; BW: Bodyweight (kg). - Dermal, systemic effects, long-term exposures (indirect skin contact (e.g. wearing washed clothes)): $DERM_{sys} = (F1 \times (M \times (F/W) \times FD \times FL) \times S_{der} \times F2 \times F3)/BW$. Key: $DERM_{sys}$: Systemic dose following dermal exposures (mg/kg bw/day); F1: Ingredient fraction by weight (fraction); M: Amount of undiluted product used (g); F: Fraction remaining in final liquor before spinning (fraction); W: Total fabric weight (g); FD: Fabric density (mg/cm²); FL: Fraction of liquor remaining in fabric after final spinning (fraction); S_{der}: Surface area exposed skin (cm²); F2: Fraction of product layer in contact with skin (cm); F3: Fraction remaining on skin; BW: Bodyweight (kg). - Dermal, systemic effects, long-term exposures (direct skin contact-fabric treated with ironing aids): $DERM_{sys} = (F1 \times M \times 1000 \times F2 \times F3)/BW$. Key: $DERM_{sys}$: Systemic dose following dermal exposures (mg/kg bw/day); F1: Ingredient fraction by weight (fraction); M: Amount of undiluted product used (g); F2: Fraction of product layer in contact with skin (cm); F3: Fraction remaining on skin; BW: Bodyweight (kg). - Oral, systemic effects, long-term exposures: $ORAL_{sys} = (F1 \times C_p \times T_a \times S_a)/BW$. Key: $ORAL_{sys}$: Systemic dose following oral exposures (mg/kg bw/day); F1: Ingredient fraction by weight (fraction); C_p: Concentration in product (mg/mL); T_a: Amount of water left on dishes after rinsing (mL/cm²); S_a: Area of dishes in daily contact with food (cm²); BW: Bodyweight (kg).
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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.
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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:

PC3 Air care products:

- CS1: AISE C17 Air fresheners aerosol (aqueous, non-aqueous).

- CS2: AISE C18 Air fresheners non aerosol (perfume in/on solid substrate, diffusers (heated+electrical), candles).

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

2. Conditions of use affecting exposure

2.1 Control of consumer exposure

Product characteristics:	<p>Concentration of substance (F1 x 100): Unless otherwise stated, covers concentrations up to 3%.</p> <ul style="list-style-type: none"> - AISE C17 (aqueous): up to 0,8%. - AISE C17 (non-aqueous): up to 1,0%. <p>Physical state: liquid. Vapour pressure: 0,0305 Pa at 25 °C Oral contact foreseen: No.</p>
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Amounts used:	Use amounts: Total mass sprayed per use (C'): - AISE C17 (aqueous): 8400 mg/task. - AISE C17 (non-aqueous): 5400 mg/task. - AISE C18 (perfume in/on solid substrate): 1,74 mg/task. - AISE C18 (diffusers (heated +electrical), candles): 0,72 mg/task. Time weight average concentration predicted using the BAMA indoor air single spray model (TWA BAMA): - AISE C17 (aqueous): 2647,8 mg/m3. - AISE C17 (non-aqueous): 1702,1 mg/m3. - AISE C18 (perfume in/on solid substrate): 20,795 mg/m3. - AISE C18 (diffusers (heated +electrical), candles): 1,372 mg/m3.
Frequency and duration of use/exposure:	Duration covers exposure up to (T): AISE C17, C18 (perfume in/on solid substrate): 0.25 hours/event. AISE C18 (diffusers (heated+electrical), candles): 4 hours/event. Frequency - covers use frequency (n): up to 1 time/day.
Other given operational conditions affecting consumers exposure:	Inhalation exposure model: AISE C17, AISE C18 (perfume in/on solid substrate): covers use in room size of 2.5 m3. AISE C18 (diffusers (heated+electrical), candles): covers use in room size of 58 m3.
Conditions and measures related to information and behavioral advice to consumers:	Assessment tool used: AISE REACT Consumer Tool and BAMA (British Aerosol Manufacturers' Association) Indoor Single Spray Air Model for inhalation exposure.
Conditions and measures related to personal protection and hygiene:	General ventilation: Unless otherwise stated, ventilation rate: 2 air changes/ hour. - AISE C18 (diffusers (heated+electrical), candles): 0.5 air changes/ hour.
2.2 Control of environmental exposure	
General:	All risk management measures utilised must also comply with all relevant local regulations.
Product characteristics:	Physical state: liquid. Vapour pressure: 0,0305 Pa at 25 °C
Amounts used:	Daily wide dispersive use: 0,000011 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. Consumer use. Release fraction to air from process (initial release): 1,00; (final release): 1,00. Release fraction to wastewater from process (initial release): 1,00; (final release): 1,00. Local release rate: 0,011 kg/day. Release fraction to soil from process (final release): 0,20.
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=90,9%). Size of municipal sewage system/treatment plant: >=2000 m3/day (standard town).
Conditions and measures related to external treatment of waste for disposal:	Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)
Conditions and measures related to external recovery of waste:	External recovery and recycling of waste should comply with applicable local and/or national regulations.
Additional good practice advice. 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

Health

Information for contributing scenario (1): AISE C17 (aqueous)

Assessment method: AISE REACT Consumer Tool and BAMA (British Aerosol Manufacturers' Association) BAMA Indoor Air Single Spray Model. Only highest figures are presented here.

Exposure estimation:

	Route	Exposure estimate	RCR	Notes
Consumer, short-term, systemic	Inhalation	21,18 mg/m3	0,847	AISE C17 (aqueous)
Consumer, short-term, systemic	Combined routes	N/A	0,847	AISE C17 (aqueous)

	<u>Route</u>	<u>Exposure estimate</u>	<u>RCR</u>	<u>Notes</u>
Consumer, long-term, systemic	Inhalation	0,221 mg/m ³	0,177	AISE C17 (aqueous)
Consumer, long-term, systemic	Combined routes	N/A	0,177	AISE C17 (aqueous)

Environment

Information for contributing scenario (2): ERC8a

Assessment method: CHESAR V2.1.

Exposure estimation:

<u>Compartment</u>	<u>PEC</u>	<u>RCR</u>	<u>Notes</u>
Freshwater	0,0003846 mg/L	0,023	
Freshwater sediment	0,244 mg/kg dw	0,023	
Marine water	0,00003698 mg/L	0,022	
Marine water sediment	0,023 mg/kg dw	0,022	
Soil	0,015 mg/kg dw	<0,01	
STP	0,0005007 mg/L	<0,01	
Man via environment	0,000007273 mg/m ³ / 0,0003113 mg/kg bw/day	<0,01 / <0,01	Inhalation / Oral
Man 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:	<p>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. Potential inhalation exposures to benzyl benzoate arising from consumer use of air care products which contain this substance up to 3 % were assessed using the AISE REACT consumer tool and BAMA (British Aerosol Manufacturers' Association) Indoor Air Single Spray Model using the following modified algorithms to derive consumer use exposures.</p> <p>- Inhalation, systemic effects, long-term exposures: $INH_{ext} = F1 \times TWA_{BAMA} \times (T/24)$. Key: INH_{ext}: External inhalation concentration (mg/m³); F1: Ingredient fraction by weight (fraction); TWA BAMA: Time weighted average concentration predicted using the BAMA indoor air single spray model assuming 100% product (mg/m³); T: Duration of exposure (hours).</p> <p>- Inhalation, systemic effects, acute exposures: $INH_{ext} = F1 \times TWA_{BAMA}$. Key: INH_{ext}: External inhalation concentration (mg/m³); F1: Ingredient fraction by weight (fraction); TWA BAMA: Time weighted average concentration predicted using the BAMA indoor air single spray model assuming 100% product (mg/m³).</p>
Environment:	<p>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.</p>

Exposure scenario (11): Consumer use - Consumer end-use of polishes and wax blends**1. Exposure scenario (11)****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, 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:

PC31 Polishes and wax blends.

- CS1: AISE C20 Furniture floor and leather care (waxes and creams, non-spray).

- CS2: AISE C20 Furniture floor and leather care (spray, liquid).

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 (F1 x 100): Up to 0,6%. Physical state: liquid. Vapour pressure: 0,0305 Pa at 25 °C Spray: AISE C20 (waxes and creams, non-spray): No. AISE C20 (spray, liquid): Yes.
Amounts used:	Use amounts: - Total mass sprayed per use (C'): AISE C20 (spray, liquid): 6000 mg/task. - Concentration in wash solution (C): AISE C20 (spray, liquid): 1000 mg/cm3.
Frequency and duration of use/exposure:	Duration covers exposure (inhalation): AISE C20 (spray, liquid): up to 1 hour/event. Frequency - covers use frequency (n): up to 1 time/day.
Human factors not influenced by risk management:	Dermal transfer factor = 1.
Other given operational conditions affecting consumers exposure:	Body weight (BW): 60 kg. Inhalation exposure model (C"): AISE C20 (spray, liquid): covers use in room size of 58 m3. Skin contact area (Sder): AISE C20 (waxes and creams, non-spray): up to 875,5 cm2. AISE C20 (spray, liquid): up to 857,5 cm2. Thickness of product layer in contact with skin (Tder): 0,01 cm. Fraction of product layer in contact with skin (F2): AISE C20 (spray, liquid): 1. Fraction remaining on skin (F3): AISE C20 (spray, liquid): 1.
Conditions and measures related to information and behavioral advice to consumers:	Assessment tool used: AISE C20 (waxes and creams, non-spray): ECETOC TRA 3 model (consumer module) for dermal exposures. AISE C20 (spray, liquid): AISE REACT Consumer Tool for inhalation and dermal exposures.

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: 0,0305 Pa at 25 °C
Amounts used:	Daily wide dispersive use: 0,000011 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/Outdoor use. Consumer use. Release fraction to air from process (initial release): 1,00; (final release): 1,00. Release fraction to wastewater from process (initial release): 1,00; (final release): 1,00. Local release rate: 0,011 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=90,9%). Size of municipal sewage system/treatment plant: >=2000 m3/day (standard town).
Conditions and measures related to external treatment of waste for disposal:	Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)
Conditions and measures related to external recovery of waste:	External recovery and recycling of waste should comply with applicable local and/or national regulations.
Additional good practice advice. 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

Health

Information for contributing scenario (1): AISE C20 (waxes and creams, non-spray), AISE C20 (spray, liquid)

Assessment method: ECETOC TRA 3 model (consumer module); AISE REACT Consumer Tool. Only highest figures are presented here.

Exposure estimation:

	Route	Exposure estimate	RCR	Notes
Consumer, short-term, systemic	Inhalation	6,207 mg/m3	0,248	AISE C20 (spray, liquid)
Consumer, short-term, systemic	Combined routes	N/A	0,248	AISE C20 (spray, liquid)

	<u>Route</u>	<u>Exposure estimate</u>	<u>RCR</u>	<u>Notes</u>
Consumer, long-term, systemic	Dermal	0,858 mg/kg bw/day	0,660	AISE C20 (waxes and creams, non-spray), AISE C20 (spray, liquid)
Consumer, long-term, systemic	Inhalation	0,259 mg/m3	0,207	AISE C20 (spray, liquid)
Consumer, long-term, systemic	Combined routes	N/A	0,867	AISE C20 (spray, liquid)

Environment

Information for contributing scenario (2): ERC8d

Assessment method: CHESAR V2.1.

Exposure estimation:

<u>Compartment</u>	<u>PEC</u>	<u>RCR</u>	<u>Notes</u>
Freshwater	0,0003846 mg/L	0,023	ERC8d
Freshwater sediment	0,244 mg/kg dw	0,023	ERC8d
Marine water	0,00003698 mg/L	0,022	ERC8d
Marine water sediment	0,023 mg/kg dw	0,022	ERC8d
Soil	0,015 mg/kg dw	<0,01	ERC8d
STP	0,0005007 mg/L	<0,01	ERC8d
Man via environment	0,000007273 mg/m3 / 0,0003113 mg/kg bw/day	<0,01 /<0,01	Inhalation / Oral (ERC8d)
Man via environment-Combined routes	N/A	<0,01	ERC8d

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

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

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Potential inhalation and dermal exposures to benzyl benzoate arising from consumer use of polishes and wax blend products which contain this substance up to 0,6 % were assessed using the AISE REACT consumer tool or the ECETOC TRA 3 model (consumer module). Dermal exposures for AISE C20 (wax/cream non-spray) products were assessed using the ECETOC TRA 3 (consumer module). Inhalation and dermal exposures for AISE C20 (spray, liquid) products were assessed using the AISE REACT model using the following modified algorithms to derive consumer use exposures.

- Inhalation, systemic effects, long-term exposures: $INH_{ext} = (F1 \times C')/C'' \times (T/24)$. Key: INH_{ext} : External inhalation concentration (mg/m3); F1: Ingredient fraction by weight (fraction); C': Total mass sprayed per use (mg/task); C'': Room volume (m3); T: Duration of exposure (hours).
- Inhalation, systemic effects, acute exposures: $INH_{ext} = (F1 \times C')/C''$. Key: INH_{ext} : External inhalation concentration (mg/m3); F1: Ingredient fraction by weight (fraction); C': Total mass sprayed per use (mg/task); C'': Room volume (m3).
- Dermal, systemic effects, long-term exposures: $DERM_{sys} = (F1 \times C \times T_{der} \times F2 \times F3 \times S_{der} \times n)/BW$. Key: $DERM_{sys}$: Systemic dose following dermal exposures (mg/kg bw/day); F1: Ingredient fraction by weight (fraction); C: Concentration in wash solution (mg/cm3); T_{der} : Thickness of product layer in contact with skin (cm); F2: Fraction of product layer in contact with skin (cm); F3: Fraction remaining on skin; S_{der} : Surface area exposed skin (cm2); n: Daily frequency of product use; BW: Bodyweight (kg).

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 cosmetics**1. Exposure scenario (12)****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.

SDS Name: Kalama* Benzyl Benzoate USP/FCC

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

2. Conditions of use affecting exposure	
2.1 Control of consumer exposure	
General:	For cosmetic and personal care products, risk assessment only required for the environment under REACH as human health is covered by alternative legislation.
2.2 Control of environmental exposure	
General:	All risk management measures utilised must also comply with all relevant local regulations.
Product characteristics:	Physical state: liquid. Vapour pressure: 0,0305 Pa at 25 °C
Amounts used:	Daily wide dispersive use: 0,000011 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. Consumer use. Release fraction to air from process (initial release): 1,00; (final release): 1,00. Release fraction to wastewater from process (initial release): 1,00; (final release): 1,00. Local release rate: 0,011 kg/day. Release fraction to soil from process (final release): 0.
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=90,9%). Size of municipal sewage system/treatment plant: >=2000 m3/day (standard town).
Conditions and measures related to external treatment of waste for disposal:	Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)
Conditions and measures related to external recovery of waste:	External recovery and recycling of waste should comply with applicable local and/or national regulations.
Additional good practice advice. 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

Environment			
Information for contributing scenario (2): ERC8a			
Assessment method: CHESAR V2.1.			
Exposure estimation:			
Compartment	PEC	RCR	Notes
Freshwater	0,0003846 mg/L	0,023	
Freshwater sediment	0,244 mg/kg dw	0,023	
Marine water	0,00003698 mg/L	0,022	
Marine water sediment	0,023 mg/kg dw	0,022	
Soil	0,015 mg/kg dw	<0,01	
STP	0,0005007 mg/L	<0,01	
Man via environment	0,000007273 mg/m3 / 0,0003113 mg/kg bw/day	<0,01 / <0,01	Inhalation / Oral
Man 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.
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