Safety Data Sheet

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

Revision date: 2020-07-22

Supercedes: 2019-08-21

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

1.1. Product identifier:

Product trade name:	Kalama* Benzyl Alcohol NF-Parenteral
Company product number:	BZALCPAR
REACH registration number:	01-2119492630-38-0021
Substance name:	Benzyl alcohol
Substance identification number:	EC 202-859-9; EC index number: 603-057-00-5
Other means of identification:	Benzene methanol; Phenylcarbinol; alpha-Hydroxytoluene; Phenylmethanol; (Hydroxymethyl)benzene; alpha-Toluenol

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

Uses:	Intermediate. Odour agent. Laboratory chemical. Photosensitive agent and other photochemical. Solvent. Viscosity adjuster. Flow improver. 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 1296 NW Third Street Kalama, WA 98625 United States Telephone: +1-360-673-2550 1499 SE Tech Center Place, Suite 300 Vancouver, WA 98683 United States Telephone: +1-360-954-7100
EU Only Representative:	Penman Consulting bvba Avenue des Arts 10 B-1210 Brussels Belgium Telephone: +32 (0) 2 305 0698 email: pcbvba09@penmanconsulting.com
For further information about this SDS:	Email: product.compliance@emeraldmaterials.com

1.4. Emergency telephone number:

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

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture:

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

Acute Toxicity, Oral, category 4 , H302
Eye Irritation, category 2, H319
Acute Toxicity, Inhalation, category 4 , H332

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.
H319 Causes serious eye irritation.
H332 Harmful if inhaled.

Precautionary statements:
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P264 Wash skin thoroughly after handling.
P280 Wear eye protection/face protection.
P301+P312 IF SWALLOWED: Call a POISON CENTRE/doctor if you feel unwell.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P312 Call a POISON CENTRE/doctor if you feel unwell.
P337+P313 If eye irritation persists: Get medical advice/attention.

Supplemental information: No Additional Information

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

2.3. Other hazards:

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

See Section 11 for toxicological information.

SECTION 3: Composition/information on ingredients

3.1. Substance:

CAS-No.	Chemical Name	Weight%	Classification	H Statements
0000100-51-6	Benzyl alcohol	100	Acute Tox. 4 Inhalation- Acute Tox. 4 Oral- Eye Irrit. 2	H302-319-332

CAS-No.	Chemical Name	Weight%	REACH Registration No.	EC/List Number
0000100-51-6	Benzyl alcohol	100	01-2119492630-38-0021	202-859-9

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

Skin contact: 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:

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

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

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media:

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

Unsuitable: None known.

5.2. Special hazards arising from the substance or mixture:

Unusual fire/explosion hazards: Product is not considered a fire hazard, but will burn if ignited. Product can form a flammable vapor/air mixture at temperatures at or above the flash point. Closed container may rupture (due to build up in pressure) when exposed to extreme heat.

Hazardous combustion products: Irritating or toxic substances will 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 breathe dust, vapor, aerosol, mist or gas. 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. Wash contaminated clothing before reuse. Provide eyewash fountains and safety showers in the work area.

7.2. Conditions for safe storage, including any incompatibilities:

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

7.3. Specific end use(s):

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

SECTION 8: Exposure controls / personal protection

8.1. Control parameters:

Occupational exposure limits (OEL):

Chemical Name	EU OELV	EU IOELV	ACGIH - TWA/Ceiling	ACGIH - STEL
Benzyl alcohol	N/E	N/E	N/E	N/E

Chemical Name	UK WEL	Ireland OEL
Benzyl alcohol	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 alcohol

Population	Route	Acute (local)	Acute (systemic)	Long Term (local)	Long Term (systemic)
Workers	Inhalation	NE	110 mg/m3	N/E	22 mg/m3
Workers	Dermal	N/E	40 mg/kg bw/day	N/E	8 mg/kg bw/day
General population	Inhalation	N/E	27 mg/m3	N/E	5,4 mg/m3
General population	Dermal	N/E	20 mg/kg bw/day	N/E	4 mg/kg bw/day
General population	Oral	N/E	20 mg/kg bw/day	N/E	4 mg/kg bw/day
Humans via the environment	Inhalation	N/E	N/E	N/E	5,4 mg/m3
Humans via the environment	Oral	N/E	N/E	N/E	4 mg/kg bw/day

Predicted No Effect Concentration (PNECs):

Benzyl alcohol

Compartment	PNEC
Freshwater	1 mg/L
Freshwater sediment	5,27 mg/kg dw
Marine water	0,1 mg/L
Marine water sediment	0,527 mg/kg dw
Intermittent releases	2,3 mg/L
Soil	0,456 mg/kg dw
STP	39 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: Safety glasses or goggles required.

Hand protection: Avoid skin contact when mixing or handling the material by wearing impervious and chemical resistant gloves. In case of prolonged immersion or frequently repeated contact, gloves with breakthrough times greater than 240 minutes (protection class 5 or greater) are recommended. For brief contact or splash applications, gloves with breakthrough times of 10 minutes or greater are recommended (protection class 1 or greater). Suggested materials for protective gloves: Butyl rubber, PVC, Viton. Incompatible materials: neoprene / natural rubber / nitrile. 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: In case of insufficient ventilation, wear suitable respiratory equipment. Wear an approved respirator (e.g., an organic vapor respirator, a full face air purifying respirator for organic vapors, or a self-contained breathing apparatus) whenever exposure to aerosol, mist, spray, fume or vapor exceed the applicable exposure limit(s) of any chemical substance listed in this SDS. Gas mask with filter Type A.

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

Environmental exposure controls: See Sections 6 and 12.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties:

Form:	Liquid	**pH:**	Not Available
Appearance:	Colorless	**Relative density:**	1.045 @ 25 °C
Odour:	Slight aromatic	**Partition coefficient (n-octanol/water):**	1.05 @ 20°C
Odour threshold:	Not Available	**% Volatile by weight:**	100%
Solubility in water:	40 g/L @ 25°C	**VOC:**	100%
Evaporation rate:	< 0.01	**Boiling point °C:**	205 °C @ 1013 hPa
Vapour pressure:	<1 mm Hg @ 20 °C	**Boiling point °F:**	401 °F @ 1013 hPa
Vapour density:	3.7 (Air=1)	**Flash point:**	99-100 °C (210-213 °F) Closed Cup
Viscosity:	5.8-8 cP @ 20°C	**Autoignition temperature:**	436 °C (817 °F)
Melting point/Freezing point:	-15.4- -15.3 °C (4.3-4.5 °F)	**Flammability (solid, gas):**	Not Applicable (liquid)
Oxidising properties:	Not oxidizing	**Flammability or explosive limits:**	LFL/LEL: 1.3%
Explosive properties:	Not explosive		UFL/UEL: 13%
Decomposition temperature:	Not Available	**Surface tension:**	

9.2. Other information:

Amounts specified are typical and do not represent a specification.

SECTION 10: Stability and reactivity

10.1. Reactivity:

Can react violently in contact with strong oxidizing agents, isocyanates, acetaldehyde, lithium aluminum hydride, aluminum alkyl compounds, strong mineral acids (i.e. sulfuric acid), and hydrogen bromide.

10.2. Chemical stability:

This product is stable. In the presence of air, benzyl alcohol will very slowly oxidize to benzaldehyde.

10.3. Possibility of hazardous reactions:

Hazardous polymerization will not occur.

10.4. Conditions to avoid:

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

10.5. Incompatible materials:

Avoid strong acids and oxidizing agents. Avoid contact with iron and aluminum. Will attack some form of plastics.

10.6. Hazardous decomposition products:

Carbon dioxide and carbon monoxide. Benzaldehyde.

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. Overexposure by inhalation or ingestion may cause dizziness, drowsiness, headache, nausea, vomiting, diarrhea, convulsions, central nervous system depression and loss of consciousness.

Eyes: Causes serious eye irritation.

Skin: May be harmful in contact with skin. Repeated or prolonged contact may cause irritation, dermatitis, defatting and drying or cracking of the skin. Repeated or prolonged skin contact may cause allergic reactions with susceptible persons.

Inhalation: Harmful if inhaled. Inhalation at high vapor concentrations may cause respiratory tract irritation and central nervous effects.

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

Acute toxicity information: Harmful if inhaled - Category 4. Harmful if swallowed - Category 4.

Chemical Name	Inhalation LC50	Species	Oral LD50	Species	Dermal LD50	Species
Benzyl alcohol	>4178 mg/m3 (4 hours, aerosol)	Rat/ adult	1620 mg/kg	Rat/ adult male	N/E	N/E

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

Chemical Name	Skin irritation	Species
Benzyl alcohol	Non-irritant (OECD 404)	Rabbit/ adult

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

Chemical Name	Eye irritation	Species
Benzyl alcohol	Irritant (OECD 405)	Rabbit/ adult

Respiratory or skin sensitization: Not classified (based on available data, the classification criteria are not met). BENZYL ALCOHOL: This material has a low potential to cause allergic skin reactions, however cases of skin sensitization have been reported.

Chemical Name	Skin sensitisation	Species
Benzyl alcohol	Non-sensitizer	Weight of evidence

Carcinogenicity: Not classified (based on available data, the classification criteria are not met). BENZYL ALCOHOL: Under conditions of a two-year NTP gavage study, there was no evidence of carcinogenic activity for rats or mice receiving 200 or 400 mg/kg bw/day.

Germ cell mutagenicity: Not classified (based on available data, the classification criteria are not met). BENZYL ALCOHOL: Ames testing showed no mutagenic activity and mixed results both positive and negative were observed from other in-vitro genotoxicity assays. Benzyl alcohol showed no genotoxicity during in-vivo testing. The weight of the evidence indicates this material is not mutagenic or clastogenic.

Reproductive toxicity: Not classified (based on available data, the classification criteria are not met). BENZYL ALCOHOL - READ-ACROSS: Reproductive toxicity (benzoic acid), 4-generation oral study in rats: NOAEL (no-observed adverse-effect-level) of 500 mg/kg/day. Developmental toxicity (sodium benzoate), oral, rats and mice: NOAEL of >=175 mg/kg bw/day can be established for developmental effects. Benzyl alcohol - no effects on reproductive organs were observed in subchronic and long-term studies with rats and mice.

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

Specific target organ toxicity (STOT) - repeated exposure: Not classified (based on available data, the classification criteria are not met). BENZYL ALCOHOL: Long term animal studies indicate a gavage NOAEL (no-observed-adverse-effect-level) >= 400 mg/kg/day for rats and >=200 mg/kg/day for mice. At higher doses, effects on bodyweights, brain lesions, thymus, skeletal muscle, kidneys, liver and central nervous system were observed. In a 4-week inhalation study in rats on Benzyl Alcohol, no adverse effects were observed with a no-observed-adverse-effect level (NOAEC) of 1072 mg/m3.

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

Other toxicity information: No additional information available.

SECTION 12: Ecological information

12.1. Toxicity:

Chemical Name	Species	Acute	Acute	Chronic
Benzyl alcohol	Fish	LC50 460 mg/L (96 hours)	LC50 >100 mg/L(96 hours)	N/E
Benzyl alcohol	Invertebrates	EC50 230 mg/L (48 hours)	EC50 400 mg/L(24 hours)	NOEC 51 mg/L (21 days)
Benzyl alcohol	Algae	EC50 770 mg/L (72 hours)	N/E	NOEC 310 mg/L(72 hours)
Benzyl alcohol	Micro-organisms	EC50 390 mg/L (24 hours)		

12.2. Persistence and degradability:

Chemical Name	Biodegradation
Benzyl alcohol	Readily biodegradable (OECD 301C & 301A)

12.3. Bioaccumulative potential:

Chemical Name	Bioconcentration Factor (BCF)	Log Kow
Benzyl alcohol	1.37 L/kg (calculated)	1.05 @ 20°C

12.4. Mobility in soil:

Chemical Name	Mobility in soil (Koc/Kow)
Benzyl alcohol	15.7 (calculated)

12.5. Results of PBT and vPvB assessment:

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

12.6. Other adverse effects:

No additional information available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods:

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

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

SECTION 14: Transport information

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

14.1. UN number: N/A

14.2. UN proper shipping name:

Not regulated - See Bill of Lading for Details

14.3. Transport hazard class(es):

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

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

14.4. Packing group: N/A

14.5. Environmental hazards:

Marine pollutant: Not Applicable

Hazardous substance (USA): Not Applicable

14.6. Special precautions for user:

Not Applicable

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

Chemical Name	Category
Benzyl alcohol	Category Y

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
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.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.

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

Evaulation 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 alcohol.
EC# 202-859-9 / CAS# 100-51-6
REACH Registration number: 01-2119492630-38-0021

List of exposure scenarios:

ES1: Formulation of preparations - Industrial
ES2: Formulation in materials - Industrial
ES3: Formulation of preparations - Professional
ES4: Use at industrial sites - Intermediates
ES5: Use at industrial sites - Building & Construction/Distributors - Industrial
ES6: Use at industrial sites - Adhesives and sealants, coatings and paints, thinners, paint removers, fillers, putties, plasters, modelling clay, metal and non-metal surface treatment products, ink and toners
ES7: Use at industrial sites - Lubricants, greases & release products
ES8: Use at industrial sites - Paper/board dye, finishing/impregnation
ES9: Use at industrial sites - Photo-chemicals
ES10: Use at industrial sites - Use in polymer preparations
ES11: Use at industrial sites - Textile dyes, finishing/impregnation products
ES12: Use at industrial sites - Washing & cleaning products - Cosmetic & personal care products
ES13: Use at industrial sites - Industrial use as laboratory reagent
ES14: Use by professional workers - Professional use - Indoor
ES15: Use by professional workers - Professional use - Outdoor
ES16: Use by professional workers - Professional use as laboratory reagent
ES17: Consumer use - Consumer uses

General remarks:

The first tier environmental exposure assessments have at first instance been performed using EUSES 2.1.2 which is part of Chemical Safety Assessment and Reporting tool version 2.2 (CHESAR v2.2). Higher tier assessments have been performed if safe use was not demonstrated using first tier assessments. In these cases Specific Environmental Release Categories (SpERCs) have been used or release fractions have been defined according to the A&B-tables in Appendix 1 of the Technical Guidance Document on Risk Assessment, Part II (2003).

The first tier worker exposure assessments have at first instance been performed using Worker TRA v3 which is part of Chemical Safety Assessment and Reporting tool version 2.2 (CHESAR v2.2). For some worker contributing scenarios worker exposure assessments have been performed using ECETOC TRA version 3 (ECETOC TRA v3) and the Advanced REACH Tool (ART v1.5) (inhalation exposures). The RiskofDerm Tier 2 model was used to refine dermal exposure estimates, if necessary. The most critical hazard assessment conclusions for benzyl alcohol are the available derived no-effect levels (DNELs) for acute and long-term systemic effects via inhalation and dermal route.

Benzyl alcohol is classified with Eye Irrit 2; H319 ("Causing serious eye irritation") and, therefore, the hazard assessment conclusion for benzyl alcohol for effects on eyes is "Low hazard (no threshold derived)". Adequate Risk Management Measures (RMMs) and Operational Conditions (OCs) have to be applied to ensure that low hazard substances can be used safely. Personal protective equipment (PPE) that has to be applied when using a low hazard substance which causes serious eye irritation: Chemical goggles. General RMMs/OCs that have to be applied when using a low hazard substance are as follows:
- 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 consumers the most critical hazard assessment conclusions for benzyl alcohol are the available derived no-effect levels (DNELs) for acute and long-term systemic effects via inhalation, dermal and oral route. Therefore quantitative assessments regarding acute and long-term systemic inhalation, dermal and oral exposure have been performed. For all consumer contributing scenarios second tier consumer exposure assessments have been performed using ConsExpo v4.1.

Exposure scenario (1): Formulation of preparations - Industrial

1. Exposure scenario (1)

Short title of the exposure scenario:

Formulation of preparations - Industrial

List of use descriptors:

Product category (PC): PC0, PC1, PC3, PC8, PC9a, PC9b, PC14, PC15, PC18, PC19, PC20, PC21, PC23, PC24, PC26, PC27, PC28, PC29, PC30, PC31, PC32, PC34, PC35, PC39.
Process category (PROC): PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC13.
Environmental release category (ERC): ERC2 (SpERC: ESVOC 2.2.v1)

List of names of contributing worker scenarios and corresponding PROCs:

PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.
PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition.
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.
PROC13 Treatment of articles by dipping and pouring.

Name of contributing environmental scenario and corresponding ERCs:

ERC2 Formulation into mixture.

Further explanations:

Formulation of solvent-borne substances encompasses a wide range of activities such as transfers, mixing, tabletting, compression, pelletilisation and sampling. Substance losses are reduced through use of general and site-specific risk management measures to maintain workplace concentrations of airborne VOCs and particulates below respective OELs; and through use of closed or covered equipment/ processes to minimize evaporative losses of VOCs. Substance losses to waste water are generally restricted to equipment cleaning as processes operate without contact with water Such uses and substance properties result in limited to no discharge to wastewater or to soil from the industrial site.

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

2. Conditions of use affecting exposure

2.1 Control of workers exposure

General:	Personal protective equipment (PPE) that has to be applied when using a low hazard substance which causes serious eye irritation: Chemical goggles. General RMMs/OCs that have to be applied when using a low hazard substance are as follows: - 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
Product characteristics:	Concentration of substance: Up to 100%. Physical state: liquid.

Frequency and duration of use/exposure:	Duration: <=8 hours/day.
Human factors not influenced by risk management:	Exposed skin surface: - PROC1, PROC3: 240 cm2 (one hand, face side only). - PROC2, PROC4, PROC5, PROC9, PROC13: 480 cm2 (two hands, face side only). - PROC8a, PROC8b: 960 cm2 (two hands).
Other given operational conditions affecting workers exposure:	Location: Indoor use. Domain: Industrial use. Process temperature (for liquid): <= 40 °C.
Technical conditions and measures to control dispersion from source towards the worker:	General ventilation: 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, PROC13: No. Local exhaust ventilation: - PROC1, PROC2, PROC3: Not required. - PROC4, 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. Chemical safety goggles. Dermal protection: - PROC1, PROC2, PROC3: No (Effectiveness Dermal: 0%). - PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC13: Yes (chemically resistant gloves conforming to EN374 with basic employee training) (Effectiveness Dermal: 90%).
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply:	Generally accepted standards of occupational hygiene are maintained. Minimisation of manual phases/work tasks. Minimisation of splashes and spills. Avoidance of contact with contaminated tools and objects. Regular cleaning of equipment and work area. Training staff on good practice. Management/supervision in place to check that RMMs in place are being used correctly and OCs followed.
2.2 Control of environmental exposure	
Product characteristics:	Physical state: liquid. Vapour pressure: 7 Pa at 20 °C
Amounts used:	Maximum daily use at a site: 70 ton/day. Maximum annual use at a site: 1450 tons/year. Percentage of tonnage used at regional scale: 10 %.
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:	Indoor use. Industrial use. Release fraction to air from process (initial release): 0.0025; (final release): 0.00125. Local release rate: 87.5 kg/day (SpERC ESVOC 2.2.v1). Release fraction to wastewater from process (initial release): 0.005; (final release): 0.0015. Local release rate: 105 kg/day (SpERC ESVOC 2.2.v1). Release fraction to soil from process (final release): 0.0001 (SpERC ESVOC 2.2.v1).

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil:	Process efficiency: Process optimized for highly efficient use of raw materials (very minimal environmental release). Dry sludge application to agricultural soil: Yes (default). On-site treatment of off-air: Typical measures to maintain workplace concentrations or airborne VOCs and particulates below respective OELS (e.g. thermal wet scrubber - gas removal and/or air filtration - particle removal and/or thermal oxidation and/or vapour recovery - adsorption). Upgrade of the system in place or additional air treatment measures (Upgrade of the system in place or additional air treatment measures, such as wet scrubber and/or air filtration and/or thermal oxidation and/or vapour recovery systems, in order to achieve a reduction of the air emissions.) (Effectiveness Air: 50%). On-site treatment of wastewater: Acclimated biological treatment (Effectiveness Water: 70%). Equipment cleaning: No release to wastewater from process as such, wastewater emissions limited to release generated from final equipment cleaning step using water.
Conditions and measures related to municipal sewage treatment plant:	Municipal Sewage Treatment Plant (STP): Yes (Efficiency=87.36%). 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): PROC2, PROC3, PROC5, PROC8a, PROC8b, PROC13

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

Exposure estimation:

	Route	Exposure estimate	RCR	Notes
Worker, long-term, systemic	Dermal	1,371 mg/kg bw/day	0,171	PROC2, PROC5, PROC8a, PROC8b, PROC13
Worker, long-term, systemic	Inhalation	13,52 mg/m3	0,614	PROC3
Worker, long-term, systemic	Combined routes	N/A	0,701	PROC3
Worker, acute, systemic	Dermal	1,371 mg/kg bw/day	0,034	PROC2, PROC5, PROC8a, PROC8b, PROC13
Worker, acute, systemic	Inhalation	54,07 mg/m3	0,492	PROC3
Worker, acute, systemic	Combined routes	N/A	0,509	PROC3

Environment

Information for contributing scenario (2): ERC2 (SpERC ESVOC 2.2.v1)

Assessment method: EUSES 2.1.2.

Exposure estimation:

Compartment	PEC	RCR	Notes
Freshwater	0,667 mg/L	0,667	
Freshwater sediment	3,449 mg/kg dw	0,654	
Marine water	0,067 mg/L	0,667	
Marine water sediment	0,345 mg/kg dw	0,654	
Soil	0,223 mg/kg dw	0,49	
STP	6,634 mg/L	0,17	
Man via environment	0,0015 mg/m3 / 0,007 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:	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, no respirator required. Duration of activity: <=8 hours/day. PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC13: Wear chemical resistant gloves (tested to EN 374) in combination with basic employee training. Local exhaust ventilation: PROC1, PROC2, PROC3: Not required. PROC4, PROC5, PROC8a, PROC9, PROC13: Yes (90% effectiveness). PROC8b: Yes (95% effectiveness). Personal protective equipment (PPE) that has to be applied when using a low hazard substance which causes serious eye irritation: Chemical goggles. 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 in materials - Industrial

1. Exposure scenario (2)

Short title of the exposure scenario:

Formulation in materials - Industrial

List of use descriptors:

Product category (PC): PC0, PC1, PC3, PC8, PC9a, PC9b, PC14, PC15, PC18, PC19, PC20, PC21, PC23, PC24, PC26, PC27, PC28, PC29, PC30, PC31, PC32, PC34, PC35, PC39

Process category (PROC): PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC13.

Environmental release category (ERC): ERC3

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.

PROC13 Treatment of articles by dipping and pouring.

Name of contributing environmental scenario and corresponding ERCs:

ERC3 Formulation into solid matrix.

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:	Personal protective equipment (PPE) that has to be applied when using a low hazard substance which causes serious eye irritation: Chemical goggles. General RMMs/OCs that have to be applied when using a low hazard substance are as follows: - 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
Product characteristics:	Concentration of substance: Up to 100%. Physical state: liquid.
Frequency and duration of use/exposure:	Duration: <=8 hours/day.
Human factors not influenced by risk management:	Exposed skin surface: - PROC1, PROC3: 240 cm2 (one hand, face side only). - PROC2, PROC4, PROC5, PROC9, PROC13: 480 cm2 (two hands, face side only). - PROC8a, PROC8b: 960 cm2 (two hands).

Other given operational conditions affecting workers exposure:	Location: Indoor use. Domain: Industrial use. Process temperature (for liquid): <= 40 °C.
Technical conditions and measures to control dispersion from source towards the worker:	General ventilation: 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, PROC13: No. Local exhaust ventilation: - PROC1, PROC2, PROC3: Not required. - PROC4, 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. Chemical safety goggles. Dermal protection: - PROC1, PROC2, PROC3: No (Effectiveness Dermal: 0%). - PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC13: Yes (chemically resistant gloves conforming to EN374 with basic employee training) (Effectiveness Dermal: 90%).
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply:	Generally accepted standards of occupational hygiene are maintained. Minimisation of manual phases/work tasks. Minimisation of splashes and spills. Avoidance of contact with contaminated tools and objects. Regular cleaning of equipment and work area. Training staff on good practice. Management/supervision in place to check that RMMs in place are being used correctly and OCs followed.
2.2 Control of environmental exposure	
Product characteristics:	Physical state: liquid. Vapour pressure: 7 Pa at 20 °C
Amounts used:	Maximum daily use at a site: 1.5 ton/day. Maximum annual use at a site: 150 tons/year. Percentage of tonnage used at regional scale: 10 %.
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 m3/day (default).
Other given operational conditions affecting environmental exposure:	Indoor use. Release fraction to air from process (initial release): 0.30; (final release): 0.30. Local release rate: 450 kg/day. Release fraction to wastewater from process (initial release): 0.002; (final release): 0.002. Local release rate: 3 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).
Conditions and measures related to municipal sewage treatment plant:	Municipal Sewage Treatment Plant (STP): Yes (Efficiency=87.36%). 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): PROC2, PROC3, PROC5, PROC8a, PROC8b, PROC13.

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

Exposure estimation:

	Route	Exposure estimate	RCR	Notes
Worker, long-term, systemic	Dermal	1,371 mg/kg bw/day	0,171	PROC2, PROC5, PROC8a, PROC8b, PROC13
Worker, long-term, systemic	Inhalation	13,52 mg/m3	0,614	PROC3
Worker, long-term, systemic	Combined routes	N/A	0,701	PROC3
Worker, acute, systemic	Dermal	1,371 mg/kg bw/day	0,034	PROC2, PROC5, PROC8a, PROC8b, PROC13
Worker, acute, systemic	Inhalation	54,07 mg/m3	0,492	PROC3
Worker, acute, systemic	Combined routes	N/A	0,509	PROC3

Environment

Information for contributing scenario (2): ERC3

Assessment method: EUSES 2.1.2.

Exposure estimation:

Compartment	PEC	RCR	Notes
Freshwater	0,023 mg/L	0,023	
Freshwater sediment	0,117 mg/kg dw	0,022	
Marine water	0,00227 mg/L	0,023	
Marine water sediment	0,012 mg/kg dw	0,022	
Soil	0,019 mg/kg dw	0,042	
STP	0,19 mg/L	<0,01	
Man via environment	0,034 mg/m3 / 0,037 mg/kg bw/day	<0,01 / <0,01	Inhalation / Oral
Man via environment-Combined routes	N/A	0,016	

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, no respirator required. Duration of activity: <=8 hours/day. PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC13: Wear chemical resistant gloves (tested to EN 374) in combination with basic employee training. Local exhaust ventilation: PROC1, PROC2, PROC3: Not required. PROC4, PROC5, PROC8a, PROC9, PROC13: Yes (90% effectiveness). PROC8b: Yes (95% effectiveness). Personal protective equipment (PPE) that has to be applied when using a low hazard substance which causes serious eye irritation: Chemical goggles. 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 (3): Formulation of preparations - Professional

1. Exposure scenario (3)

Short title of the exposure scenario:

Formulation of preparations - Professional

List of use descriptors:

Product category (PC): PC0, PC1, PC3, PRC8, PC9a, PC9b, PC14, PC15, PC18, PC19, PC20, PR21, PRC23, PC24, PC26, PC27, PC28, PC29, PC30, PC31, PC32, PC34, PC35, PC39.

Process category (PROC): PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC13, PROC19.

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.

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.
PROC13 Treatment of articles by dipping and pouring.
PROC19 Manual activities involving hand contact. Addresses tasks, where exposure of hands and forearms can be expected; no dedicated tools or specific exposure controls other than PPE can be put in place.

Name of contributing environmental scenario and corresponding ERCs:

ERC2 Formulation into mixture.

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:	Personal protective equipment (PPE) that has to be applied when using a low hazard substance which causes serious eye irritation: Chemical goggles. General RMMs/OCs that have to be applied when using a low hazard substance are as follows: - 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
Product characteristics:	Concentration of substance: - PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC13: Up to 100%. - PROC19: <=20%. Physical state: liquid. Vapour pressure: <7 Pa at 20 °C
Frequency and duration of use/exposure:	Duration: - PROC1, PROC3, PROC4, PROC5, PROC8b, PROC9, PROC13: <=8 hours/day. - PROC2, PROC8a: <=4 hours/day. - PROC19: 15 minutes - 1 hour/day.
Human factors not influenced by risk management:	Exposed skin surface: - PROC1, PROC3: 240 cm2 (one hand, face side only). - PROC2, PROC4, PROC5, PROC9, PROC13: 480 cm2 (two hands, face side only). - PROC8a, PROC8b: 960 cm2 (two hands).
Other given operational conditions affecting workers exposure:	Location: Indoor use. Domain: Professional use. Process temperature (for liquid): <= 40 °C. Assessment tool used: PROC19: ECETOC TRA v3 for inhalation and dermal exposure. Deviation from ECETOC TRA: yes, a linear concentration reduction approach is used. The concentration of the substance in the product is taken into account following a linear concentration reduction approach instead of the default ECETOC TRA factors for modifying exposure due to percentage of substance in preparation.

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, PROC13, PROC19: No. Local exhaust ventilation: - PROC1, PROC2, PROC19: Not required. - PROC3, PROC4, PROC5, PROC8a, PROC9, PROC13: Yes (80% effectiveness). - PROC8b: Yes (90% effectiveness). Occupational Health and Safety Management System: Basic.
Conditions and measures related to personal protection, hygiene and health evaluation:	Respiratory protection: Not required. Chemical safety goggles. Dermal protection: - PROC1, PROC3: No (Effectiveness Dermal: 0%). - PROC2, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC13: Yes (chemically resistant gloves conforming to EN374) (Effectiveness Dermal: 80%). - PROC19: Gloves APF 10 (minimum efficiency dermal: 90%).
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply:	Generally accepted standards of occupational hygiene are maintained. Minimisation of manual phases/work tasks. Minimisation of splashes and spills. Avoidance of contact with contaminated tools and objects. Regular cleaning of equipment and work area. Training staff on good practice. Management/supervision in place to check that RMMs in place are being used correctly and OCs followed.
2.2 Control of environmental exposure	
Product characteristics:	Physical state: liquid. Vapour pressure: 7 Pa at 20 °C
Amounts used:	Maximum daily use at a site: 2 ton/day. Maximum annual use at a site: 200 tons/year. Percentage of tonnage used at regional scale: 10 %.
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 m3/day (default).
Other given operational conditions affecting environmental exposure:	Indoor use. Professional use. Release fraction to air from process (initial release): 0.025; (final release): 0.025. Local release rate: 50 kg/day. Release fraction to wastewater from process (initial release): 0.02; (final release): 0.02. Local release rate: 40 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).
Conditions and measures related to municipal sewage treatment plant:	Municipal Sewage Treatment Plant (STP): Yes (Efficiency=87.36%). 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): PROC2, PROC8a, PROC19

Assessment method: CHESAR v2.2 Worker TRA v3. PROC19 only: ECETOC TRA Worker v3. Only highest figures are presented here.

Exposure estimation:

	Route	Exposure estimate	RCR	Notes
Worker, long-term, systemic	Dermal	2,82 mg/kg bw/day	0,353	PROC19
Worker, long-term, systemic	Inhalation	13,52 mg/m3	0,614	PROC2, PROC8a
Worker, long-term, systemic	Combined routes	N/A	0,957	PROC8a
Worker, acute, systemic	Dermal	2,82 mg/kg bw/day	0,07	PROC19
Worker, acute, systemic	Inhalation	90,2 mg/m3	0,82	PROC19
Worker, acute, systemic	Combined routes	N/A	0,891	PROC19

Environment

Information for contributing scenario (2): ERC2

Assessment method: EUSES 2.1.2.

Exposure estimation:

Compartment	PEC	RCR	Notes
Freshwater	0,256 mg/L	0,256	
Freshwater sediment	1,326 mg/kg dw	0,252	
Marine water	0,026 mg/L	0,256	
Marine water sediment	0,133 mg/kg dw	0,252	
Soil	0,09 mg/kg dw	0,198	
STP	2,527 mg/L	0,065	
Man via environment	0,004 mg/m3 / 0,007 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: 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, no respirator required. Duration of activity: PROC1, PROC3, PROC4, PROC5, PROC8b, PROC9, PROC13: <=8 hours/day. PROC2, PROC8a: <=4 hours/day. PROC19: 15 minutes - 1 hour/day. PROC2, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC13: Yes (chemically resistant gloves conforming) (Effectiveness Dermal: 80%). PROC19: Gloves APF 10 (minimum efficiency dermal: 90%). Local exhaust ventilation: PROC1, PROC2, PROC19: Not required. PROC3, PROC4, PROC5, PROC8a, PROC9, PROC13: Yes (80% effectiveness). PROC8b: Yes (90% effectiveness). Personal protective equipment (PPE) that has to be applied when using a low hazard substance which causes serious eye irritation: Chemical goggles. Concentration of substance: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC13: Up to 100%. PROC19: <=20%.

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 - Intermediates

1. Exposure scenario (4)

Short title of the exposure scenario:

Use at industrial sites - Intermediates

List of use descriptors:

Sector of use category (SU): SU8, SU9

Product category (PC): PC19

Process category (PROC): PROC1, PROC2, PROC3, PROC8b, PROC9.

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.

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.

Name of contributing environmental scenario and corresponding ERCs:

ERC6a Use of 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:	Personal protective equipment (PPE) that has to be applied when using a low hazard substance which causes serious eye irritation: Chemical goggles. General RMMs/OCs that have to be applied when using a low hazard substance are as follows: - 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
Product characteristics:	Concentration of substance: Up to 100%. Physical state: liquid. Vapour pressure at elevated temperature:<381 Pa.
Frequency and duration of use/exposure:	Duration: <=8 hours/day.
Human factors not influenced by risk management:	Exposed skin surface: - PROC1, PROC3: 240 cm2 (one hand, face side only). - PROC2, PROC9: 480 cm2 (two hands, face side only). - PROC8b: 960 cm2 (two hands).
Other given operational conditions affecting workers exposure:	Location: Indoor use. Domain: Industrial use. Process temperature (for liquid): - PROC1, PROC2, PROC3: <=180°C. - PROC8b, PROC9:<= 40 °C.
Technical conditions and measures to control dispersion from source towards the worker:	General ventilation: Basic general ventilation (1-3 air changes per hour): 0%. Containment: - PROC1: Closed system (minimal contact during routine operations). - PROC2: Closed continuous process with occasional controlled exposure. - PROC3: Closed batch process with occasional controlled exposure. - PROC8b, PROC9: Semi-closed process with occasional controlled exposure. Local exhaust ventilation: - PROC1, PROC2, PROC3: Not required. - PROC9: 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. Chemical safety goggles. Dermal protection: - PROC1, PROC2, PROC3: No (Effectiveness Dermal: 0%). - PROC8b, PROC9: Yes (chemically resistant gloves conforming to EN374 with basic employee training) (Effectiveness Dermal: 90%).
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply:	Generally accepted standards of occupational hygiene are maintained. Minimisation of manual phases/work tasks. Minimisation of splashes and spills. Avoidance of contact with contaminated tools and objects. Regular cleaning of equipment and work area. Training staff on good practice. Management/supervision in place to check that RMMs in place are being used correctly and OCs followed.

2.2 Control of environmental exposure

Product characteristics:	Physical state: liquid. Vapour pressure: 7 Pa at 20 °C

Amounts used:	Maximum daily use at a site: 5 ton/day. Maximum annual use at a site: 100 tons/year. Percentage of tonnage used at regional scale: 10 %.
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 m3/day (default).
Other given operational conditions affecting environmental exposure:	Indoor use. Release fraction to air from process (initial release): 0.05; (final release): 0.05. Local release rate: 250 kg/day. Release fraction to wastewater from process (initial release): 0.02; (final release): 0.02. Local release rate: 100 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).
Conditions and measures related to municipal sewage treatment plant:	Municipal Sewage Treatment Plant (STP): Yes (Efficiency=87.36%). 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): PROC2, PROC3, PROC8b

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

Exposure estimation:

	Route	Exposure estimate	RCR	Notes
Worker, long-term, systemic	Dermal	1,371 mg/kg bw/day	0,171	PROC2, PROC8b
Worker, long-term, systemic	Inhalation	13,52 mg/m3	0,614	PROC3
Worker, long-term, systemic	Combined routes	N/A	0,701	PROC3
Worker, acute, systemic	Dermal	1,371 mg/kg bw/day	0,034	PROC2, PROC8b
Worker, acute, systemic	Inhalation	54,07 mg/m3	0,492	PROC3
Worker, acute, systemic	Combined routes	N/A	0,509	PROC3

Environment

Information for contributing scenario (2): ERC6a

Assessment method: EUSES 2.1.2.

Exposure estimation:

Compartment	PEC	RCR	Notes
Freshwater	0,636 mg/L	0,636	
Freshwater sediment	3,285 mg/kg dw	0,623	
Marine water	0,064 mg/L	0,636	
Marine water sediment	0,329 mg/kg dw	0,623	
Soil	0,213 mg/kg dw	0,468	
STP	6,318 mg/L	0,162	
Man via environment	0,004 mg/m3 / 0,009 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:	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, no respirator required. Duration of activity: <=8 hours/day. PROC8b, PROC9: Wear chemical resistant gloves (tested to EN 374) in combination with basic employee training. Local exhaust ventilation: PROC1, PROC2, PROC3: Not required. PROC9: Yes (90% effectiveness). PROC8b: Yes (95% effectiveness). Personal protective equipment (PPE) that has to be applied when using a low hazard substance which causes serious eye irritation: Chemical goggles. 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 - Building & Construction/Distributors - Industrial

1. Exposure scenario (5)

Short title of the exposure scenario:

Use at industrial sites - Building & Construction/Distributors - Industrial

List of use descriptors:

Sector of use category (SU): SU19
Product category (PC): PC0
Process category (PROC): PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14.
Environmental release category (ERC): ERC4 (SpERC: EFCC 4)

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.
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.
PROC14 Tabletting, compression, extrusion, pelletisation, granulation. This covers processing of mixtures and/or substances into a defined shape for further use.

Name of contributing environmental scenario and corresponding ERCs:

ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article).

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

2. Conditions of use affecting exposure

2.1 Control of workers exposure

General:	Personal protective equipment (PPE) that has to be applied when using a low hazard substance which causes serious eye irritation: Chemical goggles. General RMMs/OCs that have to be applied when using a low hazard substance are as follows: - 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
Product characteristics:	Concentration of substance: Up to 100%. Physical state: liquid.
Frequency and duration of use/exposure:	Duration: <=8 hours/day.
Human factors not influenced by risk management:	Exposed skin surface: - PROC5, PROC9, PROC13, PROC14: 480 cm2 (two hands, face side only). - PROC8a, PROC8b, PROC10: 960 cm2 (two hands).

Other given operational conditions affecting workers exposure:	Location: Indoor use. Domain: Industrial use. Process temperature (for liquid): <= 40 °C.
Technical conditions and measures to control dispersion from source towards the worker:	General ventilation: Basic general ventilation (1-3 air changes per hour): 0%. Containment: - PROC8b, PROC9: Semi-closed process with occasional controlled exposure. - PROC5, PROC8a, PROC10, PROC13, PROC14: No. Local exhaust ventilation: - PROC5, PROC8a, PROC9, PROC10, PROC13, PROC14: 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. Chemical safety goggles. Dermal protection: - PROC14: No (Effectiveness Dermal: 0%). - PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC13: Yes (chemically resistant gloves conforming to EN374 with basic employee training) (Effectiveness Dermal: 90%).
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply:	Generally accepted standards of occupational hygiene are maintained. Minimisation of manual phases/work tasks. Minimisation of splashes and spills. Avoidance of contact with contaminated tools and objects. Regular cleaning of equipment and work area. Training staff on good practice. Management/supervision in place to check that RMMs in place are being used correctly and OCs followed.
2.2 Control of environmental exposure	
Product characteristics:	Physical state: liquid. Vapour pressure: 7 Pa at 20 °C
Amounts used:	Maximum daily use at a site: 1.36 ton/day. Maximum annual use at a site: 300 tons/year. Percentage of tonnage used at regional scale: 10 %.
Frequency and duration of use:	Emission days: 220 days/year.
Environmental factors not influenced by risk management:	Flow rate of receiving surface water: >=18,000 m3/day (default).
Other given operational conditions affecting environmental exposure:	Release fraction to air from process (initial release): 0.985; (final release): 0.985. Local release rate: 1340 kg/day (SpERC EFCC 4). Release fraction to wastewater from process (initial release): 0.0; (final release): 0.0. Local release rate: 0 kg/day (SpERC EFCC 4). Release fraction to soil from process (final release): 0.0 (SpERC EFCC 4).
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil:	Dry sludge application to agricultural soil: Yes (default).
Conditions and measures related to municipal sewage treatment plant:	Municipal Sewage Treatment Plant (STP): Yes (Efficiency=87.36%). 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): PROC8a, PROC10, PROC13, PROC14

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

Exposure estimation:

	Route	Exposure estimate	RCR	Notes
Worker, long-term, systemic	Dermal	3,43 mg/kg bw/day	0,429	PROC14

	Route	Exposure estimate	RCR	Notes
Worker, long-term, systemic	Inhalation	4,506 mg/m3	0,205	PROC8a, PROC10, PROC13
Worker, long-term, systemic	Combined routes	N/A	0,548	PROC10
Worker, acute, systemic	Dermal	3,43 mg/kg bw/day	0,086	PROC14
Worker, acute, systemic	Inhalation	18,02 mg/m3	0,164	PROC8a, PROC10, PROC13
Worker, acute, systemic	Combined routes	N/A	0,232	PROC10

Environment

Information for contributing scenario (2): ERC4 (SpERC: EFCC 4)

Assessment method: EUSES 2.1.2.

Exposure estimation:

Compartment	PEC	RCR	Notes
Freshwater	0,00372 mg/L	<0,01	
Freshwater sediment	0,019 mg/kg dw	<0,01	
Marine water	0,000371 mg/L	<0,01	
Marine water sediment	0,00192 mg/kg dw	<0,01	
Soil	0,043 mg/kg dw	0,095	
STP	0 mg/L	0	
Man via environment	0,225 mg/m3 / 0,237 mg/kg bw/day	0,042 / 0,059	Inhalation / Oral
Man via environment-Combined routes	N/A	0,101	

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, no respirator required. Duration of activity: <=8 hours/day. PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC13: Wear chemical resistant gloves (tested to EN 374) in combination with basic employee training. Local exhaust ventilation: PROC5, PROC8a, PROC9, PROC10, PROC13, PROC14: Yes (90% effectiveness). PROC8b: Yes (95% effectiveness). Personal protective equipment (PPE) that has to be applied when using a low hazard substance which causes serious eye irritation: Chemical goggles. 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 at industrial sites - Adhesives and sealants, coatings and paints, thinners, paint removers, fillers, putties, plasters, modelling clay, metal and non-metal surface treatment products, ink and toners

1. Exposure scenario (6)

Short title of the exposure scenario:

Use at industrial sites - Adhesives and sealants, coatings and paints, thinners, paint removers, fillers, putties, plasters, modelling clay, metal and non-metal surface treatment products, ink and toners

List of use descriptors:

Sector of use category (SU): SU0

Product category (PC): PC1, PC9a, PC9b, PC14, PC15, PC18.

Process category (PROC): PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC12, PROC13, PROC14, PROC23, PROC24, PROC25.

Environmental release category (ERC): ERC4 (SpERC: ESVOC 5)

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.

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.
PROC12 Use of blowing agents in manufacture of foam.
PROC13 Treatment of articles by dipping and pouring.
PROC14 Tabletting, compression, extrusion, pelletisation, granulation. This covers processing of mixtures and/or substances into a defined shape for further use.
PROC23 Open processing and transfer operations at substantially elevated temperature. Describes certain processes taking place at smelters, furnaces and ovens: casting, tapping and drossing operations.
PROC24 High (mechanical) energy work-up of substances bound in /on materials and/or articles. Substantial thermal or kinetic energy applied to substance by e.g. hot rolling/forming, grinding, mechanical cutting, drilling or sanding, stripping.
PROC25 Other hot work operations with metals. Welding, soldering, gouging, brazing, flame cutting.

Name of contributing environmental scenario and corresponding ERCs:

ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article).

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

2. Conditions of use affecting exposure

2.1 Control of workers exposure

General:	Personal protective equipment (PPE) that has to be applied when using a low hazard substance which causes serious eye irritation: Chemical goggles. General RMMs/OCs that have to be applied when using a low hazard substance are as follows: - 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
Product characteristics:	Concentration of substance: - PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC12, PROC13, PROC14: Up to 100%. - PROC7: <=60%. - PROC23, PROC24, PROC25: >25% Physical state: - PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC12, PROC13, PROC14: liquid - PROC23, PROC24, PROC25: solid-included into or onto a matrix Vapour pressure: <7 Pa at 20 °C Fugacity: Low.
Frequency and duration of use/exposure:	Duration: - PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC12, PROC13, PROC14: <=8 hours/day. - PROC7, PROC23, PROC24, PROC25: >4 hours/day.
Human factors not influenced by risk management:	Exposed skin surface: - PROC12: 240 cm2 (one hand, face side only). - PROC5, PROC9, PROC13, PROC14: 480 cm2 (two hands, face side only). - PROC8a, PROC8b, PROC10: 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: - PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC12, PROC13, PROC14: CHESAR V2.2 Worker TRA v3. - PROC7, PROC23, PROC24, PROC25: ECETOC TRA v3 for inhalation and dermal exposure. Deviation from ECETOC TRA: PROC7: yes, a linear concentration reduction approach is used. The concentration of the substance in the product is taken into account following a linear concentration reduction approach instead of the default ECETOC TRA factors for modifying exposure due to percentage of substance in preparation.
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, PROC12: Semi-closed process with occasional controlled exposure. - PROC5, PROC7, PROC8a, PROC10, PROC13, PROC14, PROC23, PROC24, PROC25: No. Local exhaust ventilation: - PROC12, PROC23, PROC24, PROC25: Not required. - PROC5, PROC8a, PROC9, PROC10, PROC13, PROC14: Yes (90% effectiveness). - PROC7, 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. Chemical safety goggles. Dermal protection: - PROC12, PROC14, PROC23, PROC24, PROC25: No (Effectiveness Dermal: 0%). - PROC7: Gloves APF 20 (minimum efficiency dermal: 95%) - PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC13: Yes (chemically resistant gloves conforming to EN374 with basic employee training) (Effectiveness Dermal: 90%).
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply:	Generally accepted standards of occupational hygiene are maintained. Minimisation of manual phases/work tasks. Minimisation of splashes and spills. Avoidance of contact with contaminated tools and objects. Regular cleaning of equipment and work area. Training staff on good practice. Management/supervision in place to check that RMMs in place are being used correctly and OCs followed.
2.2 Control of environmental exposure	
Product characteristics:	Physical state: liquid. Vapour pressure: 7 Pa at 20 °C
Amounts used:	Maximum daily use at a site: 1,2 ton/day. Maximum annual use at a site: 375 tons/year. Percentage of tonnage used at regional scale: 10 %.
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:	Indoor use. Release fraction to air from process (initial release): 0.098; (final release): 0.098. Local release rate: 122.5 kg/day (SpERC ESVOC 5). Release fraction to wastewater from process (initial release): 0.02; (final release): 0.02. Local release rate: 25 kg/day (SpERC ESVOC 5). Release fraction to soil from process (final release): 0.0 (SpERC ESVOC 5).
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil:	Dry sludge application to agricultural soil: Yes (default).
Conditions and measures related to municipal sewage treatment plant:	Municipal Sewage Treatment Plant (STP): Yes (Efficiency=87.36%). 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): PROC7, PROC14

Assessment method: PROC14: CHESAR v2.2 Worker TRA v3. PROC7: ECETOC TRA Worker v3. Only highest figures are presented here.

Exposure estimation:

	Route	Exposure estimate	RCR	Notes
Worker, long-term, systemic	Dermal	3,43 mg/kg bw/day	0,429	PROC14
Worker, long-term, systemic	Inhalation	13,5 mg/m3	0,614	PROC7
Worker, long-term, systemic	Combined routes	N/A	0,774	PROC7
Worker, acute, systemic	Dermal	3,43 mg/kg bw/day	0,086	PROC14
Worker, acute, systemic	Inhalation	54,06 mg/m3	0,492	PROC7
Worker, acute, systemic	Combined routes	N/A	0,524	PROC7

Environment

Information for contributing scenario (2): ERC4 (SpERC: ESVOC 5)

Assessment method: EUSES 2.1.2.

Exposure estimation:

Compartment	PEC	RCR	Notes
Freshwater	0,162 mg/L	0,162	
Freshwater sediment	0,836 mg/kg dw	0,159	
Marine water	0,016 mg/L	0,162	
Marine water sediment	0,084 mg/kg dw	0,159	
Soil	0,063 mg/kg dw	0,139	
STP	1,579 mg/L	0,041	
Man via environment	0,028 mg/m3 / 0,034 mg/kg bw/day	<0,01 / <0,01	Inhalation / Oral
Man via environment-Combined routes	N/A	0,014	

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, no respirator required. Duration of activity:: PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC12, PROC13, PROC14: <=8 hours/day; PROC7, PROC23, PROC24, PROC25: >4 hours/day. PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC13: Wear chemical resistant gloves (tested to EN 374) in combination with basic employee training. PROC7: Gloves APF 20 (minimum efficiency dermal: 95%). Local exhaust ventilation: PROC12, PROC23, PROC24, PROC25: Not required. PROC5, PROC8a, PROC9, PROC10, PROC13, PROC14: Yes (90% effectiveness). PROC7, PROC8b: Yes (95% effectiveness). Personal protective equipment (PPE) that has to be applied when using a low hazard substance which causes serious eye irritation: Chemical goggles. Concentration of substance: PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC12, PROC13, PROC14: Up to 100%. PROC23, PROC24, PROC25: >25%. PROC7: <=60%. Physical state: liquid (PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC12, PROC13, PROC14); solid (PROC23, PROC24, PROC25-included into or onto a matrix).
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 at industrial sites - Lubricants, greases & release products

1. Exposure scenario (7)

Short title of the exposure scenario:

Use at industrial sites - Lubricants, greases & release products

List of use descriptors:

Sector of use category (SU): SU0
Product category (PC): PC24
Process category (PROC): PROC18
Environmental release category (ERC): ERC7

List of names of contributing worker scenarios and corresponding PROCs:

PROC18 General greasing /lubrication at high kinetic energy conditions. Use of lubricant or greasing agents in high kinetic energy conditions, including manual application.

Name of contributing environmental scenario and corresponding ERCs:

ERC7 Use of functional fluid at industrial site.

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:	Personal protective equipment (PPE) that has to be applied when using a low hazard substance which causes serious eye irritation: Chemical goggles. General RMMs/OCs that have to be applied when using a low hazard substance are as follows: - 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
Product characteristics:	Concentration of substance: Up to 100%. Physical state: liquid.
Frequency and duration of use/exposure:	Duration: <=8 hours/day.
Human factors not influenced by risk management:	Exposed skin surface: 960 cm2 (two hands).
Other given operational conditions affecting workers exposure:	Location: Indoor use. Domain: Industrial use. Process temperature (for liquid): <= 40 °C.
Technical conditions and measures to control dispersion from source towards the worker:	General ventilation: Basic general ventilation (1-3 air changes per hour): 0%. Containment: No. Local exhaust ventilation: Yes (90% effectiveness). Occupational Health and Safety Management System: Advanced.
Conditions and measures related to personal protection, hygiene and health evaluation:	Respiratory protection: Not required. Chemical safety goggles. Dermal protection: Yes (chemically resistant gloves conforming to EN374 with basic employee training) (Effectiveness Dermal: 90%).
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply:	Generally accepted standards of occupational hygiene are maintained. Minimisation of manual phases/work tasks. Minimisation of splashes and spills. Avoidance of contact with contaminated tools and objects. Regular cleaning of equipment and work area. Training staff on good practice. Management/supervision in place to check that RMMs in place are being used correctly and OCs followed.

2.2 Control of environmental exposure

Product characteristics:	Physical state: liquid. Vapour pressure: 7 Pa at 20 °C
Amounts used:	Maximum daily use at a site: 1 ton/day. Maximum annual use at a site: 20 tons/year. Percentage of tonnage used at regional scale: 10 %.
Frequency and duration of use:	Emission days: 20 days/year.

Environmental factors not influenced by risk management:	Flow rate of receiving surface water: >=18,000 m3/day (default).
Other given operational conditions affecting environmental exposure:	Indoor use. 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): 0.05; (final release): 0.05. Local release rate: 50 kg/day. Release fraction to soil from process (final release): 0.05.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil:	Dry sludge application to agricultural soil: Yes (default).
Conditions and measures related to municipal sewage treatment plant:	Municipal Sewage Treatment Plant (STP): Yes (Efficiency=87.36%). 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): PROC18

Assessment method: CHESAR V2.2 Worker TRA v3.

Exposure estimation:

	Route	Exposure estimate	RCR	Notes
Worker, long-term, systemic	Dermal	1,371 mg/kg bw/day	0,171	
Worker, long-term, systemic	Inhalation	9,011 mg/m3	0,41	
Worker, long-term, systemic	Combined routes	N/A	0,581	
Worker, acute, systemic	Dermal	1,371 mg/kg bw/day	0,034	
Worker, acute, systemic	Inhalation	36,05 mg/m3	0,328	
Worker, acute, systemic	Combined routes	N/A	0,362	

Environment

Information for contributing scenario (2): ERC7

Assessment method: EUSES 2.1.2.

Exposure estimation:

Compartment	PEC	RCR	Notes
Freshwater	0,32 mg/L	0,32	
Freshwater sediment	1,652 mg/kg dw	0,314	
Marine water	0,032 mg/L	0,32	
Marine water sediment	0,165 mg/kg dw	0,314	
Soil	0,11 mg/kg dw	0,242	
STP	3,159 mg/L	0,081	
Man via environment	0,000846 mg/m3 / 0,00384 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:	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, no respirator required. Duration of activity: <=8 hours/day. Wear chemical resistant gloves (tested to EN 374) in combination with basic employee training. Local exhaust ventilation: Yes (90% effectiveness). Personal protective equipment (PPE) that has to be applied when using a low hazard substance which causes serious eye irritation: Chemical goggles. 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 (8): Use at industrial sites - Paper/board dye, finishing/impregnation

1. Exposure scenario (8)

Short title of the exposure scenario:

Use at industrial sites - Paper/board dye, finishing/impregnation

List of use descriptors:

Sector of use category (SU): SU0, SU6b.
Product category (PC): PC26
Process category (PROC): PROC5, PROC6, PROC7, PROC8b, PROC10, PROC13, PROC14.
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.
PROC6 Calendering operations. Processing of large surfaces at elevated temperature e.g. calendering of textile, rubber or paper.
PROC7 Industrial spraying. Air dispersive techniques i.e. dispersion into air (= atomization) by e.g. pressurized air, hydraulic pressure or centrifugation, applicable for liquids and powders.
PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities. Transfer includes loading, filling, dumping, bagging.
PROC10 Roller application or brushing. This includes application of paints, coatings, removers, adhesives or cleaning agents to surfaces with potential exposure arising from splashes.
PROC13 Treatment of articles by dipping and pouring.
PROC14 Tabletting, compression, extrusion, pelletisation, granulation. This covers processing of mixtures and/or substances into a defined shape for further use.

Name of contributing environmental scenario and corresponding ERCs:

ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article).

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:	Personal protective equipment (PPE) that has to be applied when using a low hazard substance which causes serious eye irritation: Chemical goggles. General RMMs/OCs that have to be applied when using a low hazard substance are as follows: - 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
Product characteristics:	Concentration of substance: - PROC5, PROC6, PROC8b, PROC10, PROC13, PROC14: Up to 100%. - PROC7: <=60%. Physical state: liquid. Vapour pressure: <7 Pa at 20 °C
Frequency and duration of use/exposure:	Duration: - PROC5, PROC6, PROC8b, PROC10, PROC13, PROC14: <=8 hours/day. - PROC7: >4 hours/day.
Human factors not influenced by risk management:	Exposed skin surface: - PROC5, PROC13, PROC14: 480 cm2 (two hands, face side only). - PROC6, PROC8b, PROC10: 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: - PROC5, PROC8b, PROC10, PROC13, PROC14: CHESAR V2.2 Worker TRA v3. - PROC7: ECETOC TRA v3 for inhalation and dermal exposure. Deviation from ECETOC TRA: yes, a linear concentration reduction approach is used. The concentration of the substance in the product is taken into account following a linear concentration reduction approach instead of the default ECETOC TRA factors for modifying exposure due to percentage of substance in preparation.
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: Semi-closed process with occasional controlled exposure. - PROC5, PROC6, PROC7, PROC10, PROC13, PROC14: No. Local exhaust ventilation: - PROC5, PROC6, PROC10, PROC13, PROC14: Yes (90% effectiveness). - PROC7, 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. Chemical safety goggles. Dermal protection: - PROC14: No (Effectiveness Dermal: 0%). - PROC7: Gloves APF 20 (minimum efficiency dermal: 95%) - PROC5, PROC6, PROC8b, PROC10, PROC13: Yes (chemically resistant gloves conforming to EN374 with basic employee training) (Effectiveness Dermal: 90%).
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply:	Generally accepted standards of occupational hygiene are maintained. Minimisation of manual phases/work tasks. Minimisation of splashes and spills. Avoidance of contact with contaminated tools and objects. Regular cleaning of equipment and work area. Training staff on good practice. Management/supervision in place to check that RMMs in place are being used correctly and OCs followed.
2.2 Control of environmental exposure	
Product characteristics:	Physical state: liquid. Vapour pressure: 7 Pa at 20 °C
Amounts used:	Maximum daily use at a site: 1,2 ton/day. Maximum annual use at a site: 50 tons/year. Percentage of tonnage used at regional scale: 10 %.
Frequency and duration of use:	Emission days: 40 days/year.
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. Industrial use. Release fraction to air from process (initial release): 1.0; (final release): 1.0. Local release rate: 1250 kg/day. Release fraction to wastewater from process (initial release): 1.0; (final release): 0.0. Local release rate: 0 kg/day. Release fraction to soil from process (final release): 0.05.
Technical conditions and measures at process level (source) to prevent release:	Waterless process: yes (Effectiveness Water: 100%). No release to waste water, all used chemicals are collected and disposed of as hazardous wastes to hazardous waste incineration.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil:	Dry sludge application to agricultural soil: Yes (default).
Conditions and measures related to municipal sewage treatment plant:	Municipal Sewage Treatment Plant (STP): Yes (Efficiency=87.36%). 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): PROC7, PROC14

Assessment method: PROC14: CHESAR v2.2 Worker TRA v3. PROC7: ECETOC TRA Worker v3. Only highest figures are presented here.

Exposure estimation:

	Route	Exposure estimate	RCR	Notes
Worker, long-term, systemic	Dermal	3,43 mg/kg bw/day	0,429	PROC14
Worker, long-term, systemic	Inhalation	13,5 mg/m3	0,614	PROC7
Worker, long-term, systemic	Combined routes	N/A	0,774	PROC7
Worker, acute, systemic	Dermal	3,43 mg/kg bw/day	0,086	PROC14
Worker, acute, systemic	Inhalation	54,06 mg/m3	0,492	PROC7
Worker, acute, systemic	Combined routes	N/A	0,524	PROC7

Environment

Information for contributing scenario (2): ERC4

Assessment method: EUSES 2.1.2.

Exposure estimation:

Compartment	PEC	RCR	Notes
Freshwater	0,00372 mg/L	<0,01	
Freshwater sediment	0,019 mg/kg dw	<0,01	
Marine water	0,000371 mg/L	<0,01	
Marine water sediment	0,00192 mg/kg dw	<0,01	
Soil	0,014 mg/kg dw	0,03	
STP	0 mg/L	<0,01	
Man via environment	0,038 mg/m3 / 0,041 mg/kg bw/day	<0,01 / <0,01	Inhalation / Oral
Man via environment-Combined routes	N/A	0,017	

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, no respirator required. Duration of activity:: PROC5, PROC6, PROC8b, PROC10, PROC13, PROC14: <=8 hours/day; PROC7 >4 hours/day. PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC13: Wear chemical resistant gloves (tested to EN 374) in combination with basic employee training. PROC7: Gloves APF 20 (minimum efficiency dermal: 95%). Local exhaust ventilation: PROC5, PROC6, PROC10, PROC13, PROC14: Yes (90% effectiveness). PROC7, PROC8b: Yes (95% effectiveness). Personal protective equipment (PPE) that has to be applied when using a low hazard substance which causes serious eye irritation: Chemical goggles. Concentration of substance: PROC5, PROC6, PROC8b, PROC10, PROC13, PROC14: Up to 100%. PROC7: <=60%.
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): Use at industrial sites - Photo-chemicals

1. Exposure scenario (9)

Short title of the exposure scenario:

Use at industrial sites - Photo-chemicals

List of use descriptors:

Sector of use category (SU): SU0

Product category (PC): PC30

Process category (PROC): PROC8a, PROC8b, PROC13.
Environmental release category (ERC): ERC4

List of names of contributing worker scenarios and corresponding PROCs:

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.
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).

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:	Personal protective equipment (PPE) that has to be applied when using a low hazard substance which causes serious eye irritation: Chemical goggles. General RMMs/OCs that have to be applied when using a low hazard substance are as follows: - 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
Product characteristics:	Concentration of substance: Up to 100%. Physical state: liquid.
Frequency and duration of use/exposure:	Duration: <=8 hours/day.
Human factors not influenced by risk management:	Exposed skin surface: - PROC13: 480 cm2 (two hands, face side only). - PROC8a, PROC8b: 960 cm2 (two hands).
Other given operational conditions affecting workers exposure:	Location: Indoor use. Domain: Industrial use. Process temperature (for liquid): <= 40 °C.
Technical conditions and measures to control dispersion from source towards the worker:	General ventilation: Basic general ventilation (1-3 air changes per hour): 0%. Containment: - PROC8b: Semi-closed process with occasional controlled exposure. - PROC8a, PROC13: No. Local exhaust ventilation: - PROC8a, 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. Chemical safety goggles. Dermal protection: Yes (chemically resistant gloves conforming to EN374 with basic employee training) (Effectiveness Dermal: 90%).
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply:	Generally accepted standards of occupational hygiene are maintained. Minimisation of manual phases/work tasks. Minimisation of splashes and spills. Avoidance of contact with contaminated tools and objects. Regular cleaning of equipment and work area. Training staff on good practice. Management/supervision in place to check that RMMs in place are being used correctly and OCs followed.

2.2 Control of environmental exposure

Product characteristics:	Physical state: liquid. Vapour pressure: 7 Pa at 20 °C
Amounts used:	Maximum daily use at a site: 0.067 ton/day. Maximum annual use at a site: 20 tons/year. Percentage of tonnage used at regional scale: 10 %.
Frequency and duration of use:	Emission days: 300 days/year.

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. Industrial use. Release fraction to air from process (initial release): 1.0; (final release): 1.0. Local release rate: 67 kg/day. Release fraction to wastewater from process (initial release): 1.00; (final release): 1.00. Local release rate: 67 kg/day. Release fraction to soil from process (final release): 0.05.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil:	Dry sludge application to agricultural soil: Yes (default).
Conditions and measures related to municipal sewage treatment plant:	Municipal Sewage Treatment Plant (STP): Yes (Efficiency=87.36%). 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): PROC8a, PROC8b, PROC13

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

Exposure estimation:

	Route	Exposure estimate	RCR	Notes
Worker, long-term, systemic	Dermal	1,371 mg/kg bw/day	0,171	PROC8a, PROC8b, PROC13
Worker, long-term, systemic	Inhalation	4,506 mg/m3	0,205	PROC8a, PROC13
Worker, long-term, systemic	Combined routes	N/A	0,376	PROC8a, PROC13
Worker, acute, systemic	Dermal	1,371 mg/kg bw/day	0,034	PROC8a, PROC8b, PROC13
Worker, acute, systemic	Inhalation	18,02 mg/m3	0,164	PROC8a, PROC13
Worker, acute, systemic	Combined routes	N/A	0,198	PROC8a, PROC13

Environment

Information for contributing scenario (2): ERC4

Assessment method: EUSES 2.1.2.

Exposure estimation:

Compartment	PEC	RCR	Notes
Freshwater	0,427 mg/L	0,427	
Freshwater sediment	2,208 mg/kg dw	0,419	
Marine water	0,043 mg/L	0,427	
Marine water sediment	0,221 mg/kg dw	0,419	
Soil	0,148 mg/kg dw	0.324	
STP	4,233 mg/L	0,108	
Man via environment	0,015 mg/m3 / 0,027 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:	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, no respirator required. Duration of activity: <=8 hours/day. Wear chemical resistant gloves (tested to EN 374) in combination with basic employee training. Local exhaust ventilation: PROC8a, PROC13: Yes (90% effectiveness). PROC8b: Yes (95% effectiveness). Personal protective equipment (PPE) that has to be applied when using a low hazard substance which causes serious eye irritation: Chemical goggles. 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 (10): Use at industrial sites - Use in polymer preparations

1. Exposure scenario (10)

Short title of the exposure scenario:

Use at industrial sites - Use in polymer preparations

List of use descriptors:

Sector of use category (SU): SU0, SU11, SU12
Product category (PC): PC32
Process category (PROC): PROC13
Environmental release category (ERC): ERC4

List of names of contributing worker scenarios and corresponding PROCs:

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).

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:	Personal protective equipment (PPE) that has to be applied when using a low hazard substance which causes serious eye irritation: Chemical goggles. General RMMs/OCs that have to be applied when using a low hazard substance are as follows: - 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
Product characteristics:	Concentration of substance: Up to 100%. Physical state: liquid.
Frequency and duration of use/exposure:	Duration: <=8 hours/day.
Human factors not influenced by risk management:	Exposed skin surface: 480 cm2 (two hands, face side only).
Other given operational conditions affecting workers exposure:	Location: Indoor use. Domain: Industrial use. Process temperature (for liquid): <= 40 °C.
Technical conditions and measures to control dispersion from source towards the worker:	General ventilation: Basic general ventilation (1-3 air changes per hour): 0%. Containment: No. Local exhaust ventilation: Yes (90% effectiveness). Occupational Health and Safety Management System: Advanced.
Conditions and measures related to personal protection, hygiene and health evaluation:	Respiratory protection: Not required. Chemical safety goggles. Dermal protection: Yes (chemically resistant gloves conforming to EN374 with basic employee training) (Effectiveness Dermal: 90%).

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply:	Generally accepted standards of occupational hygiene are maintained. Minimisation of manual phases/work tasks. Minimisation of splashes and spills. Avoidance of contact with contaminated tools and objects. Regular cleaning of equipment and work area. Training staff on good practice. Management/supervision in place to check that RMMs in place are being used correctly and OCs followed.

2.2 Control of environmental exposure

Product characteristics:	Physical state: liquid. Vapour pressure: 7 Pa at 20 °C
Amounts used:	Maximum daily use at a site: 1 ton/day. Maximum annual use at a site: 20 tons/year. Percentage of tonnage used at regional scale: 10 %.
Frequency and duration of use:	Emission days: 20 days/year.
Environmental factors not influenced by risk management:	Flow rate of receiving surface water: >=18000 m3/day (default).
Other given operational conditions affecting environmental exposure:	Indoor use. Release fraction to air from process (initial release): 1.00; (final release): 1.00. Local release rate: 1000 kg/day. Release fraction to wastewater from process (initial release): 1,0; (final release): 0,0. Local release rate: 0 kg/day. Release fraction to soil from process (final release): 0.05.
Technical conditions and measures at process level (source) to prevent release:	Waterless process: yes (Effectiveness Water: 100%). No release to waste water, all used chemicals are collected and disposed of as hazardous wastes to hazardous waste incineration.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil:	Dry sludge application to agricultural soil: Yes (default).
Conditions and measures related to municipal sewage treatment plant:	Municipal Sewage Treatment Plant (STP): Yes (Efficiency=87.36%). 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): PROC13

Assessment method: CHESAR V2.2 Worker TRA v3.

Exposure estimation:

	Route	Exposure estimate	RCR	Notes
Worker, long-term, systemic	Dermal	1,371 mg/kg bw/day	0,171	
Worker, long-term, systemic	Inhalation	4,506 mg/m3	0,205	
Worker, long-term, systemic	Combined routes	N/A	0,376	
Worker, acute, systemic	Dermal	1,371 mg/kg bw/day	0,034	
Worker, acute, systemic	Inhalation	18,02 mg/m3	0,164	
Worker, acute, systemic	Combined routes	N/A	0,198	

Environment

Information for contributing scenario (2): ERC4

Assessment method: EUSES 2.1.2.

Exposure estimation:

Compartment	PEC	RCR	Notes
Freshwater	0,00372 mg/L	<0,01	

Compartment	PEC	RCR	Notes
Freshwater sediment	0,019 mg/kg dw	<0,01	
Marine water	0,000371 mg/L	<0,01	
Marine water sediment	0,00192 mg/kg dw	<0,01	
Soil	0,01 mg/kg dw	0.022	
STP	0 mg/L	<0,01	
Man via environment	0,015 mg/m3 / 0,017 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: 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, no respirator required. Duration of activity: <=8 hours/day. Wear chemical resistant gloves (tested to EN 374) in combination with basic employee training. Local exhaust ventilation: Yes (90% effectiveness). Personal protective equipment (PPE) that has to be applied when using a low hazard substance which causes serious eye irritation: Chemical goggles. 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 (11): Use at industrial sites - Textile dyes, finishing/impregnation products

1. Exposure scenario (11)

Short title of the exposure scenario:

Use at industrial sites - Textile dyes, finishing/impregnation products

List of use descriptors:

Sector of use category (SU): SU5
Product category (PC): PC34
Process category (PROC): PROC5, PROC6, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14.
Environmental release category (ERC): ERC4 (SpERC: TEGEWA 6)

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.
PROC6 Calendering operations. Processing of large surfaces at elevated temperature e.g. calendering of textile, rubber or paper.
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.
PROC14 Tabletting, compression, extrusion, pelletisation, granulation. This covers processing of mixtures and/or substances into a defined shape for further use.

Name of contributing environmental scenario and corresponding ERCs:

ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article).

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

2. Conditions of use affecting exposure

2.1 Control of workers exposure

General:	Personal protective equipment (PPE) that has to be applied when using a low hazard substance which causes serious eye irritation: Chemical goggles. General RMMs/OCs that have to be applied when using a low hazard substance are as follows: - 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
Product characteristics:	Concentration of substance: - PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14: Up to 100%. - PROC7: <=60%. Physical state: liquid. Vapour pressure: <7 Pa at 20 °C
Frequency and duration of use/exposure:	Duration: - PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14: <=8 hours/day. - PROC7: >4 hours/day.
Human factors not influenced by risk management:	Exposed skin surface: - PROC5, PROC9, PROC13, PROC14: 480 cm2 (two hands, face side only). - PROC6, PROC8a, PROC8b, PROC10: 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: - PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14: CHESAR V2.2 Worker TRA v3. - PROC7: ECETOC TRA v3 for inhalation and dermal exposure. Deviation from ECETOC TRA: yes, a linear concentration reduction approach is used. The concentration of the substance in the product is taken into account following a linear concentration reduction approach instead of the default ECETOC TRA factors for modifying exposure due to percentage of substance in preparation.
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, PROC6, PROC7, PROC8a, PROC10, PROC13, PROC14: No. Local exhaust ventilation: - PROC5, PROC6, PROC8a, PROC9, PROC10, PROC13, PROC14: Yes (90% effectiveness). - PROC7, 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. Chemical safety goggles. Dermal protection: - PROC14: No (Effectiveness Dermal: 0%). - PROC7: Gloves APF 20 (minimum efficiency dermal: 95%) - PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC10, PROC13: Yes (chemically resistant gloves conforming to EN374 with basic employee training) (Effectiveness Dermal: 90%).
Additional good practive advice. Obligations according to Article 37(4) of REACH do not apply:	Generally accepted standards of occupational hygiene are maintained. Minimisation of manual phases/work tasks. Minimisation of splashes and spills. Avoidance of contact with contaminated tools and objects. Regular cleaning of equipment and work area. Training staff on good practice. Management/supervision in place to check that RMMs in place are being used correctly and OCs followed.
2.2 Control of environmental exposure	

Product characteristics:	Physical state: liquid. Vapour pressure: 7 Pa at 20 °C
Amounts used:	Maximum daily use at a site: 0.045 ton/day. Maximum annual use at a site: 10 tons/year. Percentage of tonnage used at regional scale: 10 %.
Frequency and duration of use:	Emission days: 220 days/year.
Environmental factors not influenced by risk management:	Flow rate of receiving surface water: >=18000 m3/day (default).
Other given operational conditions affecting environmental exposure:	Indoor use. Release fraction to air from process (initial release): 0.0; (final release): 0.0. Local release rate: 0 kg/day (SpERC TEGEWA 6). Release fraction to wastewater from process (initial release): 1.00; (final release): 1.00. Local release rate: 45 kg/day (SpERC TEGEWA 6). Release fraction to soil from process (final release): 0.0 (SpERC TEGEWA 6).
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil:	Dry sludge application to agricultural soil: Yes (default).
Conditions and measures related to municipal sewage treatment plant:	Municipal Sewage Treatment Plant (STP): Yes (Efficiency=87.36%). 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 practive 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, PROC14

Assessment method: PROC14: CHESAR v2.2 Worker TRA v3. PROC7: ECETOC TRA Worker v3. Only highest figures are presented here.

Exposure estimation:

	Route	Exposure estimate	RCR	Notes
Worker, long-term, systemic	Dermal	3,43 mg/kg bw/day	0,429	PROC14
Worker, long-term, systemic	Inhalation	13,5 mg/m3	0,614	PROC7
Worker, long-term, systemic	Combined routes	N/A	0,774	PROC7
Worker, acute, systemic	Dermal	3.43 mg/kg bw/day	0,086	PROC14
Worker, acute, systemic	Inhalation	54,06 mg/m3	0,492	PROC7
Worker, acute, systemic	Combined routes	N/A	0,524	PROC7

Environment

Information for contributing scenario (2): ERC4 (SpERC TEGEWA 6).

Assessment method: EUSES 2.1.2.

Exposure estimation:

Compartment	PEC	RCR	Notes
Freshwater	0,288 mg/L	0,288	
Freshwater sediment	1,489 mg/kg dw	0,283	
Marine water	0,029 mg/L	0,288	
Marine water sediment	0,149 mg/kg dw	0,283	
Soil	0,1 mg/kg dw	0,219	
STP	2,843 mg/L	0,073	
Man via environment	0,0000855 mg/m3 / 0,00609 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:	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, no respirator required. Duration of activity: PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14: <=8 hours/day; PROC7 >4 hours/day. PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC10, PROC13: Wear chemical resistant gloves (tested to EN 374) in combination with basic employee training. PROC7: Gloves APF 20 (minimum efficiency dermal: 95%). Local exhaust ventilation: PROC5, PROC6, PROC8a, PROC9, PROC10, PROC13, PROC14: Yes (90% effectiveness). PROC7, PROC8b: Yes (95% effectiveness). Personal protective equipment (PPE) that has to be applied when using a low hazard substance which causes serious eye irritation: Chemical goggles. Concentration of substance: PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14: Up to 100%. PROC7: <=60%.
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): Use at industrial sites - Washing & cleaning products - Cosmetic & personal care products

1. Exposure scenario (12)

Short title of the exposure scenario:

Use at industrial sites - Washing & cleaning products - Cosmetic & personal care products

List of use descriptors:

Sector of use category (SU): SU0
Product category (PC): PC35, PC39
Process category (PROC): PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13.
Environmental release category (ERC): ERC4 (SpERC: ESVOC 8)

List of names of contributing worker scenarios and corresponding PROCs:

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).

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

2. Conditions of use affecting exposure

2.1 Control of workers exposure

General:	Personal protective equipment (PPE) that has to be applied when using a low hazard substance which causes serious eye irritation: Chemical goggles. General RMMs/OCs that have to be applied when using a low hazard substance are as follows: - 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
Product characteristics:	Concentration of substance: - PROC8a, PROC8b, PROC9, PROC10, PROC13: Up to 100%. - PROC7: <=60%. Physical state: liquid. Vapour pressure: <7 Pa at 20 °C

Frequency and duration of use/exposure:	Duration: - PROC8a, PROC8b, PROC9, PROC10, PROC13: <=8 hours/day. - PROC7: >4 hours/day.
Human factors not influenced by risk management:	Exposed skin surface: - PROC9, PROC13: 480 cm2 (two hands, face side only). - PROC8a, PROC8b, PROC10: 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: - PROC8a, PROC8b, PROC9, PROC10, PROC13: CHESAR V2.2 Worker TRA v3. - PROC7: ECETOC TRA v3 for inhalation and dermal exposure. Deviation from ECETOC TRA: yes, a linear concentration reduction approach is used. The concentration of the substance in the product is taken into account following a linear concentration reduction approach instead of the default ECETOC TRA factors for modifying exposure due to percentage of substance in preparation.
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. - PROC7, PROC8a, PROC10, PROC13: No. Local exhaust ventilation: - PROC8a, PROC9, PROC10, PROC13: Yes (90% effectiveness). - PROC7, 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. Chemical safety goggles. Dermal protection: - PROC7: Gloves APF 20 (minimum efficiency dermal: 95%) - PROC8a, PROC8b, PROC9, PROC10, PROC13: Yes (chemically resistant gloves conforming to EN374 with basic employee training) (Effectiveness Dermal: 90%).
Additional good practive advice. Obligations according to Article 37(4) of REACH do not apply:	Generally accepted standards of occupational hygiene are maintained. Minimisation of manual phases/work tasks. Minimisation of splashes and spills. Avoidance of contact with contaminated tools and objects. Regular cleaning of equipment and work area. Training staff on good practice. Management/supervision in place to check that RMMs in place are being used correctly and OCs followed.
2.2 Control of environmental exposure	
Product characteristics:	Physical state: liquid. Vapour pressure: 7 Pa at 20 °C
Amounts used:	Maximum daily use at a site: 5 ton/day. Maximum annual use at a site: 100 tons/year. Percentage of tonnage used at regional scale: 10 %.
Frequency and duration of use:	Emission days: 220 days/year.
Environmental factors not influenced by risk management:	Flow rate of receiving surface water: >=18000 m3/day (default).
Other given operational conditions affecting environmental exposure:	Indoor use. Industrial use. Release fraction to air from process (initial release): 0.30; (final release): 0.30. Local release rate: 1500 kg/day (SpERC ESVOC 8). Release fraction to wastewater from process (initial release): 0.0001; (final release): 0.0001. Local release rate: 0.5 kg/day (SpERC ESVOC 8). Release fraction to soil from process (final release): 0.0 (SpERC ESVOC 8).
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil:	Dry sludge application to agricultural soil: Yes (default).
Conditions and measures related to municipal sewage treatment plant:	Municipal Sewage Treatment Plant (STP): Yes (Efficiency=87.36%). 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 practive 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, PROC10

Assessment method: PROC10: CHESAR v2.2 Worker TRA v3. PROC7: ECETOC TRA Worker v3. Only highest figures are presented here.

Exposure estimation:

	Route	Exposure estimate	RCR	Notes
Worker, long-term, systemic	Dermal	2,743 mg/kg bw/day	0,343	PROC10
Worker, long-term, systemic	Inhalation	13,5 mg/m3	0,614	PROC7
Worker, long-term, systemic	Combined routes	N/A	0,774	PROC7
Worker, acute, systemic	Dermal	2,743 mg/kg bw/day	0,069	PROC10
Worker, acute, systemic	Inhalation	54,06 mg/m3	0,492	PROC7
Worker, acute, systemic	Combined routes	N/A	0,524	PROC7

Environment

Information for contributing scenario (2): ERC4 (SpERC ESVOC 8).

Assessment method: EUSES 2.1.2.

Exposure estimation:

Compartment	PEC	RCR	Notes
Freshwater	0,00688 mg/L	<0,01	
Freshwater sediment	0,036 mg/kg dw	<0,01	
Marine water	0.000687 mg/L	<0,01	
Marine water sediment	0,00355 mg/kg dw	<0,01	
Soil	0,012 mg/kg dw	0,027	
STP	0,032 mg/L	<0,01	
Man via environment	0,023 mg/m3 / 0,025 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:	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, no respirator required. Duration of activity: PROC8a, PROC8b, PROC9, PROC10, PROC13:<=8 hours/day; PROC7 >4 hours/day. PROC8a, PROC8b, PROC9, PROC10, PROC13: Wear chemical resistant gloves (tested to EN 374) in combination with basic employee training. PROC7: Gloves APF 20 (minimum efficiency dermal: 95%). Local exhaust ventilation: PROC8a, PROC9, PROC10, PROC13: Yes (90% effectiveness). PROC7, PROC8b: Yes (95% effectiveness). Personal protective equipment (PPE) that has to be applied when using a low hazard substance which causes serious eye irritation: Chemical goggles. Concentration of substance: PROC8a, PROC8b, PROC9, PROC10, PROC13: Up to 100%. PROC7: <=60%.
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 (13): Use at industrial sites - Industrial use as laboratory reagent

1. Exposure scenario (13)

Short title of the exposure scenario:

Use at industrial sites - Industrial use as laboratory reagent

List of use descriptors:
Process category (PROC): PROC15
Environmental release category (ERC): ERC4

List of names of contributing worker scenarios and corresponding PROCs:
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).

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:	Personal protective equipment (PPE) that has to be applied when using a low hazard substance which causes serious eye irritation: Chemical goggles. General RMMs/OCs that have to be applied when using a low hazard substance are as follows: - 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
Product characteristics:	Concentration of substance: Up to 100%.
Frequency and duration of use/exposure:	Duration: <=8 hours/day.
Human factors not influenced by risk management:	Exposed skin surface: 240 cm2 (one hand, face side only).
Other given operational conditions affecting workers exposure:	Location: Indoor use. Domain: Industrial use. Process temperature (for liquid): <= 40 °C.
Technical conditions and measures to control dispersion from source towards the worker:	General ventilation: Basic general ventilation (1-3 air changes per hour): 0%. Containment: No. Local exhaust ventilation: Yes (90% effectiveness). Occupational Health and Safety Management System: Advanced.
Conditions and measures related to personal protection, hygiene and health evaluation:	Respiratory protection: Not required. Chemical safety goggles. Dermal protection: No (Effectiveness Dermal: 0%).
Additional good practive advice. Obligations according to Article 37(4) of REACH do not apply:	Generally accepted standards of occupational hygiene are maintained. Minimisation of manual phases/work tasks. Minimisation of splashes and spills. Avoidance of contact with contaminated tools and objects. Regular cleaning of equipment and work area. Training staff on good practice. Management/supervision in place to check that RMMs in place are being used correctly and OCs followed.

2.2 Control of environmental exposure

Product characteristics:	Physical state: liquid. Vapour pressure: 7 Pa at 20 °C
Amounts used:	Maximum daily use at a site: 0.25 ton/day. Maximum annual use at a site: 5 tons/year. Percentage of tonnage used at regional scale: 10 %.
Frequency and duration of use:	Emission days: 20 days/year.
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. Industrial use. Release fraction to air from process (initial release): 1.0; (final release): 1.0. Local release rate: 250 kg/day. Release fraction to wastewater from process (initial release): 1.0; (final release): 0.0. Local release rate: 0 kg/day. Release fraction to soil from process (final release): 0.05.

Technical conditions and measures at process level (source) to prevent release:	Waterless process: yes (Effectiveness Water: 100%). No release to waste water, all used chemicals are collected and disposed of as hazardous wastes to hazardous waste incineration.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil:	Dry sludge application to agricultural soil: Yes (default).
Conditions and measures related to municipal sewage treatment plant:	Municipal Sewage Treatment Plant (STP): Yes (Efficiency=87.36%). 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 practive 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): PROC15

Assessment method: CHESAR V2.2 Worker TRA v3.

Exposure estimation:

	Route	Exposure estimate	RCR	Notes
Worker, long-term, systemic	Dermal	0,34 mg/kg bw/day	0,043	
Worker, long-term, systemic	Inhalation	2,253 mg/m3	0,102	
Worker, long-term, systemic	Combined routes	N/A	0,145	
Worker, acute, systemic	Dermal	0.34 mg/kg bw/day	<0,01	
Worker, acute, systemic	Inhalation	9,011 mg/m3	0,082	
Worker, acute, systemic	Combined routes	N/A	0,09	

Environment

Information for contributing scenario (2): ERC4

Assessment method: EUSES 2.1.2.

Exposure estimation:

Compartment	PEC	RCR	Notes
Freshwater	0,00372 mg/L	<0,01	
Freshwater sediment	0,019 mg/kg dw	<0,01	
Marine water	0,000371 mg/L	<0,01	
Marine water sediment	0,00192 mg/kg dw	<0,01	
Soil	0,00821 mg/kg dw	0,018	
STP	0 mg/L	<0,01	
Man via environment	0,00389 mg/m3 / 0,0047 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:	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, no respirator required. Duration of activity: <=8 hours/day. Local exhaust ventilation: Yes (90% effectiveness). Personal protective equipment (PPE) that has to be applied when using a low hazard substance which causes serious eye irritation: Chemical goggles. 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 (14): Use by professional workers - Professional use - Indoor

1. Exposure scenario (14)

Short title of the exposure scenario:

Use by professional workers - Professional use - Indoor

List of use descriptors:

Sector of use category (SU): SU0, SU19

Product category (PC): PC0, PC1, PC3, PC8, PC9a, PC9b, PC14, PC15, PC18, PC20, PC21, PC23, PC24, PC26, PC27, PC28, PC29, PC30, PC31, PC32, PC34, PC35, PC39.

Process category (PROC): PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC14, PROC21, PROC23, PROC24, PROC25.

Environmental release category (ERC): ERC8a

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.

PROC6 Calendering operations. Processing of large surfaces at elevated temperature e.g. calendering of textile, rubber or paper.

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.

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.

PROC14 Tabletting, compression, extrusion, pelletisation, granulation. This covers processing of mixtures and/or substances into a defined shape for further use.

PROC21 Low energy manipulation and handling of substances bound in/on materials or articles. Cover activities such as manual cutting, cold rolling or assembly/disassembly of material/article.

PROC23 Open processing and transfer operations at substantially elevated temperature. Describes certain processes taking place at smelters, furnaces and ovens: casting, tapping and drossing operations.

PROC24 High (mechanical) energy work-up of substances bound in /on materials and/or articles. Substantial thermal or kinetic energy applied to substance by e.g. hot rolling/forming, grinding, mechanical cutting, drilling or sanding, stripping.

PROC25 Other hot work operations with metals. Welding, soldering, gouging, brazing, flame cutting.

Name of contributing environmental scenario and corresponding ERCs:

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

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:	Personal protective equipment (PPE) that has to be applied when using a low hazard substance which causes serious eye irritation: Chemical goggles. Respiratory protection: PROC11: Yes (mimimum efficiency inhalation: 90%). General RMMs/OCs that have to be applied when using a low hazard substance are as follows: - 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 PROC11 additional RMMs/OCs: Workers wear chemical resistant protective clothing including gloves covering the whole body and for a period of 1 shift (8 hours). Respiratory protection: Yes (minimum efficiency inhalation: 90%).

Product characteristics:	Concentration of substance: - PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC10, PROC13: up to 100%. - PROC14, PROC21, PROC23, PROC24, PROC25: >25 %. - PROC11: 50%; 80%. Physical state: - PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13: liquid. - PROC14: solid. - PROC21, PROC23, PROC24, PROC25: solid-included into or onto a matrix. Vapour pressure: - PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC14: <7 Pa at 20 °C. - PROC23, PROC25: 1000 Pa. Fugacity: Medium (applicable only to PROC23, PROC24, PROC25). Dustiness of solids: (applicable only to PROC14 & PROC21). - PROC14: Low - PROC21: Medium
Frequency and duration of use/exposure:	Duration of activity: - PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14, PROC21, PROC23, PROC24, PROC25: >4-8 hours/day. - PROC11 (50%, Level, use rate 0,5 L substance/minute):<70 minutes/day. - PROC11 (80%, Level, use rate 0,8 L substance/minute):<60 minutes/day. - PROC11 (50%, Overhead, use rate 0,5 L substance/minute):<25 minutes/day. - PROC11 (80%, Overhead, use rate 0,8 L substance/minute):<20 minutes/day.
Human factors not influenced by risk management:	Exposed skin surface: - PROC9, PROC14: 240 cm2 (one hand, face side only). - PROC5, PROC8a, PROC8b, PROC13: 480 cm2 (two hands, face side only). - PROC6, PROC10, PROC21: 960 cm2 (two hands).
Other given operational conditions affecting workers exposure:	Location: Indoor use. Domain: Professional use. Process temperature (for liquid): <= 20 °C. Assessment tool used: - PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14, PROC21: ECETOC TRA v3 for dermal exposures. Advanced REACH Tool (ART v1.5) for inhalation exposure. - PROC23, PROC24, PROC25: ECETOC TRA v3 for inhalation and dermal exposure. - PROC11: RiskofDerm Tier 2 for dermal exposures. Advanced REACH Tool (ART v1.5) for inhalation exposure. Deviation from Advanced REACH Tool: PROC11: Respiratory protective equipment.
Technical conditions and measures at process level (source) to prevent release:	Spray direction: - PROC11 (Level): Only horizontal or downward spraying, away from the worker. - PROC11 (Overhead): Spraying in any direction (including upwards), away from the worker.
Technical conditions and measures to control dispersion from source towards the worker:	General ventilation: Basic general ventilation (1-3 air changes per hour): 0%. Local exhaust ventilation: Not required. Occupational Health and Safety Management System: Basic.
Conditions and measures related to personal protection, hygiene and health evaluation:	Respiratory protection: - PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14, PROC21, PROC23, PROC24, PROC25: Not required. - PROC11: Yes (mimimum efficiency inhalation: 90%). Chemical safety goggles. Dermal protection: Yes. - PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC14, PROC21, PROC23, PROC24, PROC25: Gloves APF 5 (minimum efficiency dermal: 80%). - PROC11: chemically resistant gloves conforming to EN374 with basic employee training (Effectiveness Dermal: 90%).

Additional good practive advice. Obligations according to Article 37(4) of REACH do not apply:	Generally accepted standards of occupational hygiene are maintained. Minimisation of manual phases/work tasks. Minimisation of splashes and spills. Avoidance of contact with contaminated tools and objects. Regular cleaning of equipment and work area. Training staff on good practice. Management/supervision in place to check that RMMs in place are being used correctly and OCs followed.

2.2 Control of environmental exposure

Product characteristics:	Physical state: liquid. Vapour pressure: 7 Pa at 20 °C
Amounts used:	Daily wide dispersive use: 0.00055 tons/day. Maximum annual use at a site: 1000 tons/year. Percentage of tonnage used at regional scale: 10 %.
Frequency and duration of use:	Emission days: <=365 days/year. Wide dispersive use.
Environmental factors not influenced by risk management:	Flow rate of receiving surface water: >=18000 m3/day (default).
Other given operational conditions affecting environmental exposure:	Indoor use. Professional use. Release fraction to air from process (initial release): 1.0; (final release): 1.0. Release fraction to wastewater from process (initial release): 1.0; (final release): 1.0. Local release rate: 0.55 kg/day. Release fraction to soil from process (final release): 0.0.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil:	Dry sludge application to agricultural soil: Yes (default).
Conditions and measures related to municipal sewage treatment plant:	Municipal Sewage Treatment Plant (STP): Yes (Efficiency=87.36%). 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 practive 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): PROC11 (80%), PROC23.

Assessment method: PROC11: RiskofDerm Tier 2 for dermal exposures. Advanced REACH Tool (ART v1.5) for inhalation exposure. PROC23: ECETOC TRA v3 for inhalation and dermal exposure. Only highest figures are presented here.

Exposure estimation:

	Route	Exposure estimate	RCR	Notes
Worker, long-term, systemic	Dermal	7,7 mg/kg bw/day	0,963	PROC11 (80%)
Worker, long-term, systemic	Inhalation	20 mg/m3	0,909	PROC23
Worker, long-term, systemic	Combined routes	N/A	0,999	PROC11 (80%)
Worker, acute, systemic	Dermal	15,6 mg/kg bw/day	0,39	PROC11 (80%)
Worker, acute, systemic	Inhalation	80 mg/m3	0,727	PROC23
Worker, acute, systemic	Combined routes	N/A	0,734	PROC23

Environment

Information for contributing scenario (2): ERC8a

Assessment method: EUSES 2.1.2.

Exposure estimation:

Compartment	PEC	RCR	Notes
Freshwater	0,0072 mg/L	<0,01	
Freshwater sediment	0,037 mg/kg dw	<0,01	

Compartment	PEC	RCR	Notes
Marine water	0,000719 mg/L	<0,01	
Marine water sediment	0,00371 mg/kg dw	<0,01	
Soil	0,00874 mg/kg dw	0,019	
STP	0,035 mg/L	<0,01	
Man via environment	0,0000842 mg/m3 / 0,00074 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: 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. Respiratory protection: PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14, PROC21, PROC23, PROC24, PROC25: no respirator required. PROC11: Yes (mimimum efficiency inhalation: 90%). Duration of activity: PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14, PROC21, PROC23, PROC24, PROC25: >4-8 hours/day. PROC11 (50%, Level, use rate 0,5 L substance/minute):<70 minutes/day. PROC11 (80%, Level, use rate 0,8 L substance/minute):<60 minutes/day. PROC11 (50%, Overhead, use rate 0,5 L substance/ minute):<25 minutes/day. PROC11 (80%, Overhead, use rate 0,8 L substance/minute):<20 minutes/day. Dermal protection: Yes. PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC14, PROC21, PROC23, PROC24, PROC25: Gloves APF 5 (minimum efficiency dermal: 80%). PROC11: chemically resistant gloves conforming to EN374 with basic employee training (Effectiveness Dermal: 90%). Local exhaust ventilation: Not required. Personal protective equipment (PPE) that has to be applied when using a low hazard substance which causes serious eye irritation: Chemical goggles. Concentration of substance: PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC10: up to 100%. PROC14, PROC21, PROC23, PROC24, PROC25: >25 %. PROC11: 50%; 80%.

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 (15): Use by professional workers - Professional use - Outdoor

1. Exposure scenario (15)

Short title of the exposure scenario:

Use by professional workers - Professional use - Outdoor

List of use descriptors:

Sector of use category (SU): SU0

Product category (PC): PC0, PC1, PC3, PC8, PC9a, PC9b, PC14, PC15, PC18,PC20, PC21, PC23, PC24, PC26, PC27, PC28, PC29, PC30, PC31, PC32, PC34, PC35, PC39.

Process category (PROC): PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC14, PROC21, PROC23, PROC24, PROC25.

Environmental release category (ERC): ERC8d

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.

PROC6 Calendering operations. Processing of large surfaces at elevated temperature e.g. calendering of textile, rubber or paper.

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.

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.

PROC14 Tabletting, compression, extrusion, pelletisation, granulation. This covers processing of mixtures and/or substances into a defined shape for further use.

PROC21 Low energy manipulation and handling of substances bound in/on materials or articles. Cover activities such as manual cutting, cold rolling or assembly/disassembly of material/article.

PROC23 Open processing and transfer operations at substantially elevated temperature. Describes certain processes taking place at smelters, furnaces and ovens: casting, tapping and drossing operations.
PROC24 High (mechanical) energy work-up of substances bound in /on materials and/or articles. Substantial thermal or kinetic energy applied to substance by e.g. hot rolling/forming, grinding, mechanical cutting, drilling or sanding, stripping.
PROC25 Other hot work operations with metals. Welding, soldering, gouging, brazing, flame cutting.

Name of contributing environmental scenario and corresponding ERCs:

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

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:	Personal protective equipment (PPE) that has to be applied when using a low hazard substance which causes serious eye irritation: Chemical goggles. Respiratory protection: PROC11: Yes (mimimum efficiency inhalation: 90%). General RMMs/OCs that have to be applied when using a low hazard substance are as follows: - 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 PROC11 additional RMMs/OCs: Workers wear chemical resistant protective clothing including gloves covering the whole body and for a period of 1 shift (8 hours). Respiratory protection: Yes (mimimum efficiency inhalation: 90%).
Product characteristics:	Concentration of substance: - PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC13: up to 100%. - PROC10: 80%. - PROC14, PROC21, PROC23, PROC24, PROC25: >25 %. - PROC11: 50%; 80%. Physical state: - PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13: liquid. - PROC14, PROC21: solid. - PROC23, PROC24, PROC25: solid-included into or onto a matrix. Vapour pressure: - PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC14: <7 Pa at 20 °C. - PROC23: 1000 Pa. Fugacity: Medium (applicable only to PROC23, PROC24, PROC25). Dustiness of solids: (applicable only to PROC14 & PROC21). - PROC14: Low - PROC21: Medium
Frequency and duration of use/exposure:	Duration of activity: - PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14, PROC21, PROC23, PROC24, PROC25: >4-8 hours/day. - PROC11 (50%, Level, use rate 0,5 L substance/minute):<120 minutes/day. - PROC11 (80%, Level, use rate 0,8 L substance/minute):<120 minutes/day. - PROC11 (50%, Overhead, use rate 0,5 L substance/minute):<55 minutes/day. - PROC11 (80%, Overhead, use rate 0,8 L substance/minute):<45 minutes/day.
Human factors not influenced by risk management:	Exposed skin surface: - PROC9, PROC14: 240 cm2 (one hand, face side only). - PROC5, PROC8a, PROC8b, PROC13: 480 cm2 (two hands, face side only). - PROC6, PROC10, PROC21: 960 cm2 (two hands).

Other given operational conditions affecting workers exposure:	Location: Outdoor use. Domain: Professional use. Process temperature (for liquid): <= 20 °C. Assessment tool used: - PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14, PROC21: ECETOC TRA v3 for dermal exposures. Advanced REACH Tool (ART v1.5) for inhalation exposure. - PROC23, PROC24, PROC25: ECETOC TRA v3 for inhalation and dermal exposure. - PROC11: RiskofDerm Tier 2 for dermal exposures. Advanced REACH Tool (ART v1.5) for inhalation exposure. Deviation from Advanced REACH Tool: PROC11: Respiratory protective equipment.
Technical conditions and measures at process level (source) to prevent release:	Spray direction: - PROC11 (Level): Only horizontal or downward spraying, away from the worker. - PROC11 (Overhead): Spraying in any direction (including upwards), away from the worker.
Technical conditions and measures to control dispersion from source towards the worker:	General ventilation: Outdoors. Occupational Health and Safety Management System: Basic.
Conditions and measures related to personal protection, hygiene and health evaluation:	Respiratory protection: - PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14, PROC21, PROC23, PROC24, PROC25: Not required. - PROC11: Yes (mimimum efficiency inhalation: 90%). Chemical safety goggles. Dermal protection: Yes. - PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC14, PROC21, PROC23, PROC24, PROC25: Gloves APF 5 (minimum efficiency dermal: 80%). - PROC11: chemically resistant gloves conforming to EN374 with basic employee training (Effectiveness Dermal: 90%).
Additional good practive advice. Obligations according to Article 37(4) of REACH do not apply:	Generally accepted standards of occupational hygiene are maintained. Minimisation of manual phases/work tasks. Minimisation of splashes and spills. Avoidance of contact with contaminated tools and objects. Regular cleaning of equipment and work area. Training staff on good practice. Management/supervision in place to check that RMMs in place are being used correctly and OCs followed.
2.2 Control of environmental exposure	
Product characteristics:	Physical state: liquid. Vapour pressure: 7 Pa at 20 °C
Amounts used:	Daily wide dispersive use: 0.00055 tons/day. Maximum annual use at a site: 1000 tons/year. Percentage of tonnage used at regional scale: 10 %.
Frequency and duration of use:	Emission days: <=365 days/year.
Environmental factors not influenced by risk management:	Flow rate of receiving surface water: >=18000 m3/day (default).
Other given operational conditions affecting environmental exposure:	Outdoor use. Professional use. Release fraction to air from process (initial release): 1.0; (final release): 1.0. Release fraction to wastewater from process (initial release): 1.0; (final release): 1.0. Local release rate: 0.55 kg/day. Release fraction to soil from process (final release): 0.20.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil:	Dry sludge application to agricultural soil: Yes (default).
Conditions and measures related to municipal sewage treatment plant:	Municipal Sewage Treatment Plant (STP): Yes (Efficiency=87.36%). 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 practive 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): PROC10, PROC11 (50%), PROC23.

Assessment method: PROC10: ECETOC TRA v3 for dermal exposures. Advanced REACH Tool (ART v1.5) for inhalation exposure. PROC11: RiskofDerm Tier 2 for dermal exposures. Advanced REACH Tool (ART v1.5) for inhalation exposure. PROC23: ECETOC TRA v3 for inhalation and dermal exposure. Only highest figures are presented here.

Exposure estimation: RPE=Respiratory protection equipment. PROC8a and PROC10 evaluated both with and without respiratory protection equipment.

	Route	Exposure estimate	RCR	Notes
Worker, long-term, systemic	Dermal	6,85 mg/kg bw/day	0,856	PROC11 (50%)
Worker, long-term, systemic	Inhalation	20 mg/m3	0,909	PROC23
Worker, long-term, systemic	Combined routes	N/A	0,977	PROC10
Worker, acute, systemic	Dermal	13,7 mg/kg bw/day	0,343	PROC11 (50%)
Worker, acute, systemic	Inhalation	80 mg/m3	0,727	PROC23
Worker, acute, systemic	Combined routes	N/A	0,734	PROC23

Environment

Information for contributing scenario (2): ERC8d

Assessment method: EUSES 2.1.2.

Exposure estimation:

Compartment	PEC	RCR	Notes
Freshwater	0,0072 mg/L	<0,01	
Freshwater sediment	0,037 mg/kg dw	<0,01	
Marine water	0,000719 mg/L	<0,01	
Marine water sediment	0,00371 mg/kg dw	<0,01	
Soil	0,00874 mg/kg dw	0,019	
STP	0,035 mg/L	<0,01	
Man via environment	0,0000842 mg/m3 / 0,00074 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:	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. Outdoor use. Respiratory protection: PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14, PROC21, PROC23, PROC24, PROC25: no respirator required. PROC11: Yes (mimimum efficiency inhalation: 90%). Duration of activity: PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14, PROC21, PROC23, PROC24, PROC25: >4-8 hours/day. PROC11 (50%, Level, use rate 0,5 L substance/minute):<120 minutes/day. PROC11 (80%, Level, use rate 0,8 L substance/minute):<120 minutes/day. PROC11 (50%, Overhead, use rate 0,5 L substance/minute):<55 minutes/day. PROC11 (80%, Overhead, use rate 0,8 L substance/minute):<45 minutes/day. Dermal protection: Yes. PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC14, PROC21, PROC23, PROC24, PROC25: Gloves APF 5 (minimum efficiency dermal: 80%). PROC11: chemically resistant gloves conforming to EN374 with basic employee training (Effectiveness Dermal: 90%). Personal protective equipment (PPE) that has to be applied when using a low hazard substance which causes serious eye irritation: Chemical goggles. Concentration of substance: PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC13: up to 100%. PROC10: 80%. PROC14, PROC21, PROC23, PROC24, PROC25: >25 %. PROC11: 50%; 80%.
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 (16): Use by professional workers - Professional use as laboratory reagent

1. Exposure scenario (16)

Short title of the exposure scenario:

Use by professional workers - Professional use as laboratory reagent

List of use descriptors:

Product category (PC): PC21
Process category (PROC): PROC15
Environmental release category (ERC): ERC8a

List of names of contributing worker scenarios and corresponding PROCs:

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:

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

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:	Personal protective equipment (PPE) that has to be applied when using a low hazard substance which causes serious eye irritation: Chemical goggles. General RMMs/OCs that have to be applied when using a low hazard substance are as follows: - 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
Product characteristics:	Concentration of substance: Up to 100%. Physical state: liquid.
Frequency and duration of use/exposure:	Duration: <=8 hours/day.
Human factors not influenced by risk management:	Exposed skin surface: 240 cm2 (one hand, face side only).
Other given operational conditions affecting workers exposure:	Location: Indoor use. Domain: Professional use. Process temperature (for liquid): <= 40 °C.
Technical conditions and measures to control dispersion from source towards the worker:	General ventilation: Basic general ventilation (1-3 air changes per hour): 0%. Containment: No. Local exhaust ventilation: Yes (80% effectiveness). Occupational Health and Safety Management System: Basic.
Conditions and measures related to personal protection, hygiene and health evaluation:	Respiratory protection: Not required. Chemical safety goggles. Dermal protection: No (Effectiveness Dermal: 0%).
Additional good practive advice. Obligations according to Article 37(4) of REACH do not apply:	Generally accepted standards of occupational hygiene are maintained. Minimisation of manual phases/work tasks. Minimisation of splashes and spills. Avoidance of contact with contaminated tools and objects. Regular cleaning of equipment and work area. Training staff on good practice. Management/supervision in place to check that RMMs in place are being used correctly and OCs followed.

2.2 Control of environmental exposure

Product characteristics:	Physical state: liquid. Vapour pressure: 7 Pa at 20 °C
Amounts used:	Daily wide dispersive use: <=0.01 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. Professional use. Release fraction to air from process (initial release): 1.0; (final release): 1.0. Release fraction to wastewater from process (initial release): 1.0; (final release): 1.0. Local release rate: 10 kg/day. Release fraction to soil from process (final release): 0.0.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil:	Dry sludge application to agricultural soil: Yes (default).
Conditions and measures related to municipal sewage treatment plant:	Municipal Sewage Treatment Plant (STP): Yes (Efficiency=87.36%). 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 practive 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): PROC15

Assessment method: CHESAR V2.2 Worker TRA v3.

Exposure estimation:

	Route	Exposure estimate	RCR	Notes
Worker, long-term, systemic	Dermal	0,34 mg/kg bw/day	0,043	
Worker, long-term, systemic	Inhalation	4,506 mg/m3	0,205	
Worker, long-term, systemic	Combined routes	N/A	0,247	
Worker, acute, systemic	Dermal	0,34 mg/kg bw/day	<0,01	
Worker, acute, systemic	Inhalation	18,02 mg/m3	0,164	
Worker, acute, systemic	Combined routes	N/A	0,172	

Environment

Information for contributing scenario (2): ERC8a

Assessment method: EUSES 2.1.2.

Exposure estimation:

Compartment	PEC	RCR	Notes
Freshwater	0,067 mg/L	0,067	
Freshwater sediment	0,346 mg/kg dw	0,066	
Marine water	0,0069 mg/L	0,067	
Marine water sediment	0,035 mg/kg dw	0,066	
Soil	0,028 mg/kg dw	0,062	
STP	0,632 mg/L	0,016	
Man via environment	0,0000847 mg/m3 / 0,00237 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: 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, no respirator required. Duration of activity: <=8 hours/day. Local exhaust ventilation: Yes (80% effectiveness). Personal protective equipment (PPE) that has to be applied when using a low hazard substance which causes serious eye irritation: Chemical goggles. 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 (17): Consumer use - Consumer uses

1. Exposure scenario (17)

Short title of the exposure scenario:

Consumer use - Consumer uses

List of use descriptors:

Product category (PC): PC1, PC3, PC9a, PC9b, PC18, PC23, PC28, PC31, PC34, PC35, PC39.
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:

PC1 Adhesives, sealants: Joint sealant; Tube glue; Universal/wood glue; Construction glue; Spray glue; Wood parquet glue, Mixing/Loading; Wood parquet glue, Application; Filler/Putty from tube; Two-component filler, Mixing/Loading; Two-component filler, Application; Putty spray.
PC3 Air care products: Spray application (child, post application); Spray application; Electrical evaporators; Electrical evaporators (child, post application).
PC9a Coatings and paints, thinners, paint removers: General coating; Paint remover; Brush & roller painting with solvent rich paint; Brush & roller painting with water borne paint; Pneumatic spraying.
PC9b Fillers, putties, plasters, modelling clay: Wall plaster.
PC18 Ink and toners.
PC23 Leather treatment products: Shoe polish spray; Shoe cream.
PC28 Perfumes, fragrances: Perfumed articles; Perfumed candles.
PC31 Polishes and wax blends: Shoe polish spray; Shoe cream; Floor polish; Floor sealer.
PC34 Textile dyes, and impregnating products: Loading of washing machines with liquid detergent; Manual washing with liquid detergent; Residues on clothing after washing with liquid detergent; Use of pastes.
PC35 Washing and cleaning products: Loading of washing machines with liquid detergent; Manual washing with liquid detergent; Residues on clothing after washing with liquid detergent; Use of pastes; Use of All Purpose Cleaner (Liquid Cleaner, Mixing/Loading; Liquid Cleaner, Application; Spray Cleaner, Spraying; Spray Cleaner, Cleaning)' Use of Sanitary Products (Bathroom cleaning liquid, Mixing/Loading; Bathroom cleaning liquid, Application; Bathroom cleaning spray, Spraying; Bathroom cleaning spray, Cleaning; Liquid toilet rim cleaner).
PC39 Cosmetics, personal care products.

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

2. Conditions of use affecting exposure

2.1 Control of consumer exposure

General:	PC28 & PC39: For cosmetic and personal care products, risk assessment only required for the environment under REACH as human health is covered by alternative legislation.

Product characteristics:	Concentration of substance: Unless otherwise stated, covers concentrations up to 25%. - PC1: (Two-component filler, Application) - up to 15%; (Wood parquet glue, Application) - up to 5%. - PC3 (Spray application,child, post application; Spray application; Electrical evaporators; Electrical evaporators, child, post application - up to 10%. - PC9a: (General coating) - up to 10%; (Brush & roller painting with solvent rich paint; Brush & roller painting with water borne paint; Pneumatic spraying) - up to 5%. - PC9b: (Wall plaster) - up to 10%. - PC18: (Ink and Toners) - up to 5%. - PC23: (Shoe polish spray; Shoe cream) - up to 5%. - PC28: (Perfumed candles) - up to 1.8%; (Perfumed articles) - up to 0.1%. - PC31: (Shoe polish spray; Shoe cream; Floor polish; Floor sealer) - up to 5%. - PC34: (Loading of washing machines with liquid detergent) - up to 10%; (Use of pastes) - up to 1%; (Manual washing with liquid detergent) - up to 0.1%; (Residues on clothing after washing with liquid detergent) - up to 0.01%. - PC35: (Loading of washing machines with liquid detergent; Liquid cleaner, Mixing/Loading; Spray cleaner, Spraying; Spray cleaner, Cleaning; Bathroom cleaning liquid, Mixing/Loading; Bathroom cleaning spray, Spraying; Bathroom cleaning spray, Cleaning; Liquid toilet rim cleaner) - up to 10%; (Use of pastes) - up to 1%; (Bathroom cleaning liquid, Application) - up to 0.22%; (Liquid cleaner, Application) - up to 0.12%; (Manual washing with liquid detergent) - up to 0.1%; (Residues on clothing after washing with liquid detergent) - up to 0.01%. Physical state: liquid. Vapour pressure: Unless otherwise stated <7 Pa at 20 °C. PC28 (Perfumed candles): <139 Pa at 20 °C. Average molecular weight of the matrix (product minus the compound of interest): - PC1: (Joint sealant; Tube glue; Universal/wood glue; Construction glue; Wood parquet glue, Mixing/Loading; Wood parquet glue, Application; Filler/Putty from tube; Two-component filler, Mixing/Loading; Two-component filler, Application): 3000 g/mol. - PC9a: (General coating, Paint remover; Brush & roller painting with solvent rich paint): 300 g/mol; (Brush & roller painting with water borne paint): 45 g/mol. - PC18: (Ink and Toners): 300 g/mol. - PC31: (Floor polish; Floor sealer): 22 g/mol. - PC34: (Loading of washing machines with liquid detergent): 90 g/mol. - PC35: (Liquid cleaner, Mixing/Loading; Spray cleaner, Cleaning): 22 g/mol; (Loading of washing machines with liquid detergent): 90 g/mol; (Liquid cleaner, Application; Bathroom cleaning liquid, Application): 18 g/mol; (Bathroom cleaning liquid, Mixing/Loading): 26 g/mol; (Bathroom cleaning spray, Cleaning): 36 g/mol. Airborne fraction of the non-volatile material: - PC1: (Spray glue; Putty spray): 100%. - PC3: (Electrical evaporators): 100%; (Spray application): 30%. - PC9a: (Pneumatic spraying): 20%. - PC23: (Shoe polish spray): 100%. - PC31: (Shoe polish spray): 100%. - PC35: (Spray Cleaner, Spraying; Bathroom cleaning spray, Spraying): 20%. Weight fraction of the non-volatile material: - PC1: (Spray glue): 25%; (Putty spray): 30%. - PC3: (Electrical evaporators; Spray application): 90%. - PC9a: (Pneumatic spraying): 50%. - PC23: (Shoe polish spray): 5%. - PC31: (Shoe polish spray): 5%. - PC35: (Spray Cleaner, Spraying; Bathroom cleaning spray, Spraying): 10%.

Amounts used:	Applied amounts for each use event: - PC1: (Joint sealant): covers amounts up to 75 g (inhalation); Dermal contact rate 50 mg/min for 30 min; (Tube glue): covers amounts up to 9 g (inhalation); 0.08 g (dermal); (Universal/wood glue): covers amounts up to 10 g (inhalation); 0.08 g (dermal); (Construction glue): covers amounts up to 250 g (inhalation); 0.25 g (dermal); (Spray glue): Inhalation mass generation rate 1.5 g/sec for spray duration 2.8 min; Dermal contact rate 100 mg/min for 2.8 min; (Wood parquet glue, Mixing/Loading): covers amounts up to 7000 g (inhalation); 0.2 g (dermal); (Wood parquet glue, Application): covers amounts up to 22000 g (inhalation); Dermal contact rate 30 mg/min for 300 min; (Filler/Putty from tube): covers amounts up to 40 g (inhalation); 0.05 g (dermal); (Two-component filler, Mixing/Loading): covers amounts up to 200 g (inhalation); 0.02 g (dermal); (Two-component filler, Application): covers amounts up to 200 g (inhalation); 0.2 g (dermal); (Putty spray): Inhalation mass generation rate 1.5 g/sec for spray duration 2.2 min; Dermal contact rate 100 mg/min for 2.2 min. - PC3: (Spray application (child, post application)): Dermal contact rate 269 mg/min for 0,33 min; (Spray application): Inhalation mass generation rate 1,1 g/sec for spray duration 0,33 min; Dermal contact rate 269 mg/min for 0,33 min; (Electrical evaporators): Inhalation mass generation rate 0,000022 g/sec for spray duration 480 min; (Electrical evaporators (child, post application)): Dermal contact rate 269 mg/min for 0,33 min. - PC9a: (General coating): covers amounts up to 4000 g (inhalation); 0.25 g (dermal); (Paint remover): covers amounts up to 1000 g (inhalation); 0.5 g (dermal); (Brush & roller painting with solvent rich paint): covers amounts up to 1000 g (inhalation); Dermal contact rate 30 mg/min for 180 min; (Brush & roller painting with water borne paint): covers amounts up to 1250 g (inhalation); Dermal contact rate 30 mg/min for 480 min; (Pneumatic spraying): Inhalation mass generation rate 0.5 g/sec for spray duration 180 min; Dermal contact rate 110 mg/min for 180 min. - PC9b: (Wall plaster): Dermal contact rate 50 mg/min for 120 min. - PC18: (Ink and Toners): covers amounts up to 1000 g (inhalation); Dermal contact rate 30 mg/min for 120 min. - PC23: (Shoe polish spray): Inhalation mass generation rate 0.5 g/sec for spray duration 1.2 min; Dermal contact rate 100 mg/min for 1.2 min; (Shoe cream): covers amounts up to 0.1 g (inhalation); 0.1 g (dermal). - PC28: (Perfumed articles): covers amounts up to 100 g (inhalation); 100 g (dermal); (Perfumed candles): covers amounts up to 100 g (inhalation). - PC31: (Shoe polish spray): Inhalation mass generation rate 0.5 g/sec for spray duration 1.2 min; Dermal contact rate 100 mg/min for 1.2 min; (Shoe cream): covers amounts up to 0.1 g (inhalation); 0.1 g (dermal); (Floor polish): covers amounts up to 550 g (inhalation); 5.5 g (dermal); (Floor sealer): covers amounts up to 1500 g (inhalation); 15 g (dermal). - PC34: (Loading of washing machines with liquid detergent): covers amounts up to 500 g (inhalation); 0.01 g (dermal); (Manual washing with liquid detergent): covers amounts up to 19 g (inhalation); 19 g (dermal); (Residues on clothing after washing with liquid detergent): covers amounts up to 1000 g (dermal); (Use of pastes): covers amounts up to 0.65 g (inhalation); 0.65 g (dermal). - PC35: (Loading of washing machines with liquid detergent; Liquid cleaner, Mixing/Loading; Bathroom cleaning liquid, Mixing/Loading): covers amounts up to 500 g (inhalation); 0.01 g (dermal); (Manual washing with liquid detergent): covers amounts up to 19 g (inhalation); 19 g (dermal); (Residues on clothing after washing with liquid detergent): covers amounts up to 1000 g (dermal); (Use of pastes): covers amounts up to 0.65 g (inhalation); 0.65 g (dermal); (Liquid cleaner, Application): covers amounts up to 400 g (inhalation); 19 g (dermal); (Spray cleaner, Spraying): Inhalation mass generation rate 0.78 g/sec for spray duration 0.41 min; Dermal contact rate 46 mg/min for 0.41 min; (Spray cleaner, Cleaning): covers amounts up to 16.2 g (inhalation); 0.16 g (dermal); (Bathroom cleaning liquid, Application): covers amounts up to 260 g (inhalation); 19 g (dermal); (Bathroom cleaning spray, Spraying): Inhalation mass generation rate 0.39 g/sec for spray duration 1.5 min; Dermal contact rate 46 mg/min for 1.5 min; (Bathroom cleaning spray, Cleaning): covers amounts up to 30 g (inhalation); 0.3 g (dermal); (Liquid toilet rim cleaner): covers amounts up to 70 g (inhalation).

Frequency and duration of use/exposure:	Duration: Unless otherwise stated, covers exposure up to 240 minutes: - PC1: (Joint sealant): 45 minutes/event; (Wood parquet glue, Mixing/Loading): 10 minutes/event; (Wood parquet glue, Application): 300 minutes/event; (Two-component filler, Mixing/Loading): 5 minutes/event; (Putty spray): 30 minutes/event. - PC3: (Electrical evaporators): 480 minutes/event. - PC9a: (General coating; Paint remover): 60 minutes/event; (Brush & roller painting with solvent rich paint; Pneumatic spraying): 180 minutes/event; (Brush & roller painting with water borne paint): 480 minutes/event. - PC9b: (Wall plaster): covers dermal exposure up to 120 minutes/event. Negligible release to air expected. - PC18: (Ink and Toners): 132 minutes/event. - PC23: (Shoe polish spray): 5 minutes/event; (Shoe cream): 20 minutes/event. - PC28: (Perfumed candles): 180 minutes/event. - PC31: (Shoe polish spray): 5 minutes/event; (Shoe cream): 20 minutes/event; (Floor polish; Floor sealer): 90 minutes/event. - PC34: (Loading of washing machines with liquid detergent): 0.75 minutes/event; (Manual washing with liquid detergent; Use of pastes): 10 minutes/event; (Residues on clothing after washing with liquid detergent): Not relevant. - PC35: (Loading of washing machines with liquid detergent; Liquid cleaner, Mixing/Loading; Bathroom cleaning liquid, Mixing/Loading): 0.75 minutes/event; (Residues on clothing after washing with liquid detergent): Not relevant; (Manual washing with liquid detergent; Use of pastes): 10 minutes/event; (Spray cleaner, Spraying; Spray cleaner, Cleaning): 60 minutes/event; (Bathroom cleaning liquid, Application; Bathroom cleaning spray, Spraying; Bathroom cleaning spray, Cleaning): 25 minutes/event; (Liquid toilet rim cleaner): 50 minutes/event. Frequency - covers use frequency: - PC1: (Joint sealant; Filler/Putty from tube): up to 0.008 times/day; 3 times/year; (Tube glue; Universal/wood glue): up to 0.14 times/day; 52 times/year; (Construction glue; Two-component filler, Mixing/Loading; Two-component filler, Application): up to 0.005 times/day; 2 times/year; (Spray glue): up to 0.033 times/day; 12 times/year; (Wood parquet glue, Mixing/Loading): up to 0.001 time/day; 0.375 times/year; (Wood parquet glue, Application): up to 0.0003 times/day; 0.125 times/year; (Putty spray): up to 0.003 times/day; 1 time/year. - PC3: (Spray application (child, post application); Spray application): up to 0.25 times/day; 90 times/year; (Electrical evaporators; Electrical evaporators (child, post application)): up to 0.41 times/day; 150 times/year. - PC9a: (General coating): up to 0.0009 times/day; 0.33 times/year; (Paint remover; Brush & roller painting with solvent rich paint; Brush & roller painting with water borne paint): up to 0.003 times/day; 1 time/year.(Pneumatic spraying): up to 0.005 times/day; 2 times/year. - PC9b: (Wall plaster): up to 0.0005 times/day; 0.2 times/year. - PC18: (Ink and Toners): up to 0.003 times/day; 1 time/year. - PC23: (Shoe polish spray): up to 0.022 times/day; 8 times/year; (Shoe cream): up to 0.071 time/day; 26 times/year. - PC28 (Perfumed articles; Perfumed candles): up to 0.33 times/day; 120 times/year. - PC31: (Shoe polish spray): up to 0.022 times/day; 8 times/year; (Shoe cream): up to 0.071 time/day; 26 times/year; (Floor polish): up to 0.005 times/day; 2 times/year; (Floor sealer): up to 0.0003 times/day; 0.125 times/year - PC34: (Loading of washing machines with liquid detergent; Residues on clothing after washing with liquid detergent): up to 1 time/day; 365 times/year; (Manual washing with liquid detergent): up to 0.28 times/day; 104 times/year; (Use of pastes): up to 0.35 times/day; 128 times/year. - PC35: (Loading of washing machines with liquid detergent; Residues on clothing after washing with liquid detergent; Spray cleaner, Spraying; Spray cleaner, Cleaning; Liquid toilet rim cleaner): up to 1 time/day; 365 times/year; (Manual washing with liquid detergent; Liquid cleaner, Mixing/Loading; Liquid cleaner, Application): up to 0.28 times/day; 104 times/year; (Use of pastes): up to 0.35 times/day; 128 times/year; (Bathroom cleaning spray, Spraying; Bathroom cleaning spray, Cleaning): up to 0.14 times/day; 52 times/year; (Bathroom cleaning liquid, Mixing/Loading; Bathroom cleaning liquid, Application): up to 0.011 times/day; 4 times/year.

Other given operational conditions affecting consumers exposure:	Application temperature: Unless otherwise stated, 20 °C. - PC28: (Perfumed candles): 70 °C. Body weight: Unless otherwise stated, 60 kg. - PC3: (Spray application (child, post application); Electrical evaporators (child, post application)): 8.7 kg. Inhalation exposure model - Unless otherwise stated, covers use in room size of 20 m3. - PC1: (Joint sealant): room size of 10 m3; (Wood parquet glue, Mixing/Loading; Two-component filler, Mixing/Loading): room size of 1 m3; (Wood parquet glue, Application): room size of 58 m3; (Putty spray): room size of 34 m3. - PC3: (Spray application): room size of 58 m3; (Electrical evaporators): room size of 16 m3; (Spray application (child, post application); Electrical evaporators (child, post application)): Not relevant. - PC9a: (General coating): room size of 58 m3; (Pneumatic spraying): room size of 34 m3. - PC9b: (Wall plaster): Not relevant. - PC23: (Shoe polish spray; Shoe cream): room size of 34 m3. - PC28: (Perfumed articles; Perfumed candles): room size of 16 m3. - PC31 (Shoe polish spray; Shoe cream): room size of 34 m3; (Floor polish; Floor sealer): room size of 58 m3. - PC34: (Loading of washing machines with liquid detergent; Manual washing with liquid detergent; Use of pastes): room size of 1 m3; (Residues on clothing after washing with liquid detergent): Not relevant. - PC35: (Loading of washing machines with liquid detergent; Manual washing with liquid detergent; Use of pastes; Liquid cleaner, Mixing/Loading; Bathroom cleaning liquid, Mixing/Loading): room size of 1 m3; (Residues on clothing after washing with liquid detergent): Not relevant; (Liquid cleaner, Application): room size of 58 m3; (Spray cleaner, Spraying; Spray cleaner, Cleaning): room size of 15 m3; (Bathroom cleaning liquid, Application; Bathroom cleaning spray, Spraying; Bathroom cleaning spray, Cleaning): room size of 10 m3; (Liquid toilet rim cleaner): room size of 2.5 m3. Inhalation exposure model - Release area: -PC1: (Joint sealant): 0.025 m2; (Tube glue; Filler/Putty from tube): 0.02 m2; (Universal/wood glue): 0.04 m2; (Construction glue; Wood parquet glue, Application): 1 m2; (Wood parquet glue, Mixing/Loading): 0.032 m2; (Two-component filler, Mixing/Loading): 0.01 m2; (Two-component filler, Application): 0.005 m2. - PC9a: (General coating); 22 m2; (Paint remover): 2 m2; (Brush & roller painting with solvent rich paint; Brush & roller painting with water borne paint): 10 m2. - PC18: (Ink and toners): 2 m2. - PC31: (Floor polish; Floor sealer): 22 m2. - PC34: (Loading of washing machines with liquid detergent): 0.002 m2 - PC35: (Loading of washing machines with liquid detergent; Liquid cleaner, Mixing/Loading; Bathroom cleaning liquid, Mixing/Loading): 0.002 m2; (Liquid cleaner, Application): 10 m2; (Spray cleaner, Cleaning): 1.7 m2; (Bathroom cleaning liquid, Application): 0.19 m2; (Bathroom cleaning spray, Cleaning): 6.4 m2. Inhalation rate: Unless otherwise stated, 24.1 m3/day. -PC35: (Liquid toilet rim cleaner): 12.96 m3/day. Skin contact area: Unless otherwise stated, covers skin contact area up to 215 cm2. - PC1: (Joint sealant; Tube glue; Universal/wood glue): up to 2 cm2; (Spray glue; Wood parquet glue, Application): up to 430 cm2; (Filler/Putty from tube; Two-component filler, Mixing/Loading; Two-component filler, Application; Putty spray): up to 960 cm2. - PC3: (Spray application (child, post application); Electrical evaporators (child, post application)): up to 5000 cm2; (Spray application); up to 19000 cm2. - PC9a: (General coating): up to 108 cm2; (Paint remover; Brush & roller painting with solvent rich paint; Brush & roller painting with water borne paint; Pneumatic spraying): up to 960 cm2 - PC9b: (Wall plaster): up to 1900 cm2. - PC18: (Inks and toners): up to 430 cm2. - PC23: (Shoe polish spray): up to 430 cm2. - PC31: (Shoe polish spray; Floor polish; Floor sealer): up to 430 cm2. - PC34: (Manual washing with liquid detergent): up to 1900 cm2; (Residues on clothing after washing with liquid detergent): up to 17000 cm2; (Use of pastes): up to 430 cm2. - PC35: (Manual washing with liquid detergent; Liquid cleaner, Application): up to 1900 cm2; (Residues on clothing after washing with liquid detergent): up to 17000 cm2; (Use of pastes): up to 430 cm2; (Spray cleaner, Spraying; Bathroom cleaning spray, Spraying): up to 22 cm2.

Conditions and measures related to information and behavioral advice to consumers:	Assessment tool: ConsExpo v4.1 for inhalation and dermal exposure. Deviation from default scenario: Yes - can be one or more of the following: body weight, ventilation rate, airborne fraction of the non-volatile material, weight fraction of the non-volatile material, mass generation rate, area of release increases over time, inhalation rate, application duration, exposed area dermal, room volume, release area, applied amount, average molecular weight of matrix, exposure duration, spray duration.
Conditions and measures related to personal protection and hygiene:	General ventilation: Unless otherwise stated, ventilation rate: 2 air changes/ hour. - PC1: (Tube glue; Universal/wood glue; Spray glue; Filler/Putty from tube; Two-component filler, Mixing/Loading; Two-component filler, Application): ventilation rate: 0.6 air changes/ hour; (Putty spray): ventilation rate: 1.5 air changes/ hour. - PC3: (Spray application):ventilation rate: 0.5 air changes/ hour; (Electrical evaporators): ventilation rate: 1 air change/ hour; (Spray application (child, post application); Electrical evaporators (child, post application)): Not relevant. - PC9a (General coating): ventilation rate: 3 air changes/ hour; (Paint remover): ventilation rate: 2.5 air changes/ hour - PC9b: (Wall plaster): Not relevant. - PC18: (Ink and Toners): ventilation rate: 0.6 air changes/ hour. - PC23: (Shoe polish spray; Shoe cream): ventilation rate: 1.5 air changes/ hour. - PC28: (Perfumed articles; Perfumed candles): ventilation rate: 1 air change/ hour. - PC31: (Shoe polish spray; Shoe cream): ventilation rate: 1.5 air changes/ hour; (Floor polish; Floor sealer): ventilation rate: 0.5 air changes/ hour. - PC34: (Residues on clothing after washing with liquid detergent): Not relevant. - PC35: (Residues on clothing after washing with liquid detergent): Not relevant; (Liquid cleaner, Application): ventilation rate: 0.5 air changes/ hour; (Spray cleaner, Spraying; Spray cleaner, Cleaning): ventilation rate: 2.5 air changes/ hour.
2.2 Control of environmental exposure	
Product characteristics:	Physical state: liquid. Vapour pressure: 7 Pa at 20 °C
Amounts used:	Daily wide dispersive use: <=0.0022 tons/day. Maximum annual use at a site: 4000 tons/year. Percentage of tonnage used at regional scale: 10 %.
Frequency and duration of use:	Emission days: <=365 days/year. Wide dispersive use.
Environmental factors not influenced by risk management:	Flow rate of receiving surface water: >=18000 m3/day (default).
Other given operational conditions affecting environmental exposure:	Outdoor use. Release fraction to air from process (initial release): 1.0; (final release): 1.0. Release fraction to wastewater from process (initial release): 1.0; (final release): 1.0. Local release rate: 2.2 kg/day. Release fraction to soil from process (final release): 0.20.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil:	Dry sludge application to agricultural soil: Yes (default).
Conditions and measures related to municipal sewage treatment plant:	Municipal Sewage Treatment Plant (STP): Yes (Efficiency=87.36%). 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 practive 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): PC3 (Spray application (child, post application)); PC3 (Electrical evaporators (child, post application)); PC9a (Brush & Roller painting with solvent rich paint); PC9a (Pneumatic spraying); PC28 (Perfumed candles).

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

Exposure estimation:

	Route	Exposure estimate	RCR	Notes

	Route	Exposure estimate	RCR	Notes
Consumer, short-term, systemic	Dermal	16,5 mg/kg bw/day	0,825	PC9a (Pneumatic spraying)
Consumer, short-term, systemic	Inhalation	25,6 mg/m3	0,948	PC28 (Perfumed candles)
Consumer, short-term, systemic	Combined routes	N/A	0,981	PC9a (Brush & Roller painting with solvent rich paint)
Consumer, long-term, systemic	Dermal	2,33 mg/kg bw/day	0,583	PC3 (Electrical evaporators (child, post application))
Consumer, long-term, systemic	Inhalation	3,2 mg/m3	0,593	PC28 (Perfumed candles)
Consumer, long-term, systemic	Oral	1,7 mg/kg bw/day	0,425	PC3 (Spray application (child, post application))
Consumer, long-term, systemic	Combined routes	N/A	0,938	PC3 (Electrical evaporators (child, post application))

Environment

Information for contributing scenario (2): ERC8a, ERC8d

Assessment method: EUSES 2.1.2.

Exposure estimation:

Compartment	PEC	RCR	Notes
Freshwater	0,018 mg/L	0,018	
Freshwater sediment	0,091 mg/kg dw	0,017	
Marine water	0,00176 mg/L	0,018	
Marine water sediment	0,0091 mg/kg dw	0,017	
Soil	0,012 mg/kg dw	0,027	
STP	0,139 mg/L	<0,01	
Man via environment	0,0000843 mg/m3 / 0,00084 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:	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Environment:	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.