Probenz(TM) SG Sodium Benzoate, Food Grade, Kosher

Version	Revision Date:	SDS Number:	Date of last issue: 21.09.2017
3.6	21.09.2017	150000072050	Date of first issue: 21.03.2011
PRD		SDSEU / EN / 0001	

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

1.1 Product identifier

Trade name	:	Probenz(TM) SG Sodium Benzoate, Food Grade, Kosher
Product code	:	32876-00, P3287600, P328760G, P3287604, P3287605, P3287601, P3287602, P3287603, P3287607, P328760B, P328760C, P328760D, P3287608, P328760A, P328760E, P328760F, N328760G
REACH Registration Number	:	01-2119460683-35-0001
Product Registration number	:	01-2119460683-35-0001
Substance name	:	Benzoic acid, sodium salt
CAS-No.	:	532-32-1

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

Use of the Substance/Mixture	:	Preservative, antioxidant (food grade), cosmetic component Please refer to the Annex for a listing of uses.
Recommended restrictions on use	:	None known.

1.3 Details of the supplier of the safety data sheet

Company	:	Eastman Chemical Company 200 South Wilcox Drive 37660-5280 Kingsport
Telephone	:	+14232292000
E-mail address of person responsible for the SDS	:	Visit our website at www.EASTMAN.com or email emnmsds@eastman.com

1.4 Emergency telephone number

Emergency telephone number : NCEC +44 (0)1235 239 670*:*

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Eye irritation, Category 2	H319: Causes serious eye irritation.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms :

Signal word : Warning

Hazard statements : H319 Causes serious eye irritation.

Precautionary statements : **Prevention:**

P264 Wash skin thoroughly after handling.

P280 Wear eye protection/ face protection.

Response:

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

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

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Components

Chemical name	CAS-No. EC-No. Registration number	Classification	Concentration (% w/w)
sodium benzoate	532-32-1 208-534-8 / 01-2119460683-35-0001	Eye Irrit. 2; H319	> 99
Water	7732-18-5 231-791-2		< 1

For explanation of abbreviations see section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

If inhaled : Move to fresh air.
Treat symptomatically.
Get medical attention.

In case of skin contact : Wash off with soap and water.
Take off all contaminated clothing immediately.
Wash contaminated clothing before re-use.

Get medical attention.

In case of eye contact : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes.
Get medical advice/ attention.

If swallowed : Seek medical advice.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms : Irritating to eyes, respiratory system and skin.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment : Treat symptomatically.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Use water spray to extinguish.
Dry chemical
Carbon dioxide (CO2)

Unsuitable extinguishing media : None known.

5.2 Special hazards arising from the substance or mixture

Hazardous combustion products : No hazardous combustion products are known

5.3 Advice for firefighters

Special protective equipment for firefighters : Wear an approved positive pressure self-contained breathing apparatus in addition to standard fire fighting gear.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Use personal protective equipment.
Avoid release to the environment.

6.2 Environmental precautions

Environmental precautions : Avoid release to the environment.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up : Sweep up or vacuum up spillage and collect in suitable container for disposal.

6.4 Reference to other sections

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling : Avoid contact with eyes.
Wash thoroughly after handling.
Minimize dust generation and accumulation.

Advice on protection against fire and explosion : Minimize dust generation and accumulation.

Hygiene measures : Handle in accordance with good industrial hygiene and safety practice.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : Keep container tightly closed in a dry and well-ventilated place.

7.3 Specific end use(s)

Specific use(s) : Antioxidant

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:

Substance name	End Use	Exposure routes	Potential health effects	Value
sodium benzoate	Workers	Inhalation	Long-term exposure, Systemic effects	3 mg/m3
	Workers	Inhalation	Long-term exposure, Local effects	0,1 mg/m3
	Workers	Skin contact	Long-term exposure, Systemic effects	62,5 mg/kg bw/day

Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006:

Substance name	Environmental Compartment	Value
sodium benzoate	Water	0,13 mg/l
	Marine water	0,013 mg/l
	Aqua Intermittent	0,305 mg/l
	Fresh water sediment	1,76 mg/kg
Remarks:	dry	
	Marine sediment	0,176 mg/kg

	dry	
	Soil	0,276 mg/kg
	dry	
	Sewage treatment plant	10 mg/l
	Secondary Poisoning	300 mg/kg

8.2 Exposure controls

Engineering measures

Ensure adequate ventilation.

Personal protective equipment

Eye protection : Wear eye/face protection.

Hand protection
Remarks : Wear suitable gloves.

Skin and body protection : Any specific clothing information provided is based on published literature and manufacturer data.
Body protection suitability and breakthrough time will differ depending on the specific use conditions.
Clothing to be considered for this material may include sleeves, aprons, pants depending on the use and likelihood of skin contact.
Please refer to the hand protection section for material type.

Respiratory protection : Wear respiratory protection.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance : granules

Colour : white

Odour : odourless

Odour Threshold : not determined

pH : 8

Melting point/range : 300 °C

Boiling point/boiling range : decomposes

Flash point : Not applicable

Evaporation rate : not determined

Flammability (solid, gas)	:	Not applicable
Upper explosion limit	:	not determined
Lower explosion limit	:	not determined
Vapour pressure	:	Not applicable
Relative vapour density	:	not determined
Relative density	:	1,44 (25 °C)
Solubility(ies)		
Water solubility	:	556 g/l
Partition coefficient: n-octanol/water	:	log Pow: -2,27
Auto-ignition temperature	:	not determined
Decomposition temperature	:	not determined
Explosive properties	:	Not classified
Oxidizing properties	:	Not classified

9.2 Other information

Surface tension	:	72,9 mN/m, 20 °C

SECTION 10: Stability and reactivity

10.1 Reactivity

Stable

10.2 Chemical stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

Hazardous reactions	:	None known.

10.4 Conditions to avoid

Conditions to avoid	:	Heat, flames and sparks.

10.5 Incompatible materials

Materials to avoid	:	Strong oxidizing agents

10.6 Hazardous decomposition products

Carbon dioxide (CO2), Carbon monoxide

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Product:

Acute oral toxicity : Remarks: No data available

Acute inhalation toxicity : Remarks: No data available

Acute dermal toxicity : Remarks: No data available

Skin corrosion/irritation

Product:

Remarks: No data available

Serious eye damage/eye irritation

Product:

Remarks: No data available

Components:

sodium benzoate:
Species: Rabbit
Exposure time: 24 h
Result: Eye irritation

Respiratory or skin sensitisation

Product:

Remarks: No data available

Components:

sodium benzoate:
Test Type: OECD 429: LLNA
Species: Mouse
Result: non-sensitizing

Germ cell mutagenicity

Components:

sodium benzoate:
Genotoxicity in vitro : Test Type: Salmonella typhimurium assay (Ames test)

Metabolic activation: +/- activation
Method: Bacterial Reverse Mutation Assay
Result: negative

Genotoxicity in vivo : Species: Rat
Application Route: oral: gavage
Method: Mammalian Bone Marrow Chromosome Aberration Test
Result: negative

Carcinogenicity

Product:

Remarks: This information is not available.

Reproductive toxicity

Product:

Effects on fertility : Remarks: No data available

Components:

sodium benzoate:

Effects on fertility : Species: Rat
Application Route: Ingestion
NOAEL: 500 mg/kg,
Remarks: Read-across from a similar material

Effects on foetal development : Species: Rat
Application Route: Ingestion
175 mg/kg

STOT - single exposure

Product:

Remarks: No data available

Components:

sodium benzoate:

Assessment: Not classified

STOT - repeated exposure

Product:

Remarks: No data available

Components:

sodium benzoate:

Assessment: Not classified

Repeated dose toxicity

Components:

sodium benzoate:
Species: Rat
NOAEL: 1.000 mg/kg
Application Route: Oral Study

Species: Rat
NOAEL: 2.500 mg/kg
Application Route: Dermal Study

Aspiration toxicity

Product:

No data available

Experience with human exposure

Product:

Inhalation	:	Remarks: None known.
Skin contact	:	Remarks: None known.
Eye contact	:	Remarks: Causes serious eye irritation.
Ingestion	:	Remarks: None known.

SECTION 12: Ecological information

12.1 Toxicity

Components:

sodium benzoate:

Toxicity to fish	:	LC50 (Pimephales promelas (fathead minnow)): 484 mg/l Exposure time: 96 h
Toxicity to fish (Chronic toxicity)	:	NOEC:: 10 mg/l Exposure time: 6 d Species: Danio rerio (zebra fish)

12.2 Persistence and degradability

Components:

sodium benzoate:

Biodegradability	:	Result: Readily biodegradable. Biodegradation: 75 %

Exposure time: 30 d

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

Product:

Assessment : This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher..

12.6 Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product : Dispose of in accordance with local regulations.

SECTION 14: Transport information

14.1 UN number

Not regulated as a dangerous good

14.2 UN proper shipping name

Not regulated as a dangerous good

14.3 Transport hazard class(es)

Not regulated as a dangerous good

14.4 Packing group

Not regulated as a dangerous good

14.5 Environmental hazards

Not regulated as a dangerous good

14.6 Special precautions for user

Not applicable

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

SECTION 15: Regulatory information

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

REACH - Candidate List of Substances of Very High : Not applicable

Concern for Authorisation (Article 59).

Regulation (EC) No 1005/2009 on substances that deplete the ozone layer : Not applicable

Regulation (EC) No 850/2004 on persistent organic pollutants : Not applicable

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.
Not applicable

The components of this product are reported in the following inventories:

CH INV	: On the inventory, or in compliance with the inventory
DSL	: On the inventory, or in compliance with the inventory
AICS	: On the inventory, or in compliance with the inventory
NZIoC	: On the inventory, or in compliance with the inventory
ENCS	: On the inventory, or in compliance with the inventory
ISHL	: On the inventory, or in compliance with the inventory
KECI	: On the inventory, or in compliance with the inventory
PICCS	: On the inventory, or in compliance with the inventory
IECSC	: On the inventory, or in compliance with the inventory
TCSI	: On the inventory, or in compliance with the inventory
TSCA	: On the inventory, or in compliance with the inventory

15.2 Chemical safety assessment

None.

SECTION 16: Other information

Full text of H-Statements

H319 : Causes serious eye irritation.

Full text of other abbreviations

Eye Irrit. : Eye irritation

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road; AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN

- Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

Further information

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

ZW / EN

Annex

Probenz(TM) SG Sodium Benzoate, Food Grade, Kosher

150000072050

Contents:

Exposure scenario I.	Formulation of the substance and its mixtures in batch or continuous operations within closed or contained systems, including incidental exposures during storage, materials transfers, mixing, maintenance, sampling and associated laboratory activities.
Exposure scenario II.	Industrial use, Use in Washing and Cleaning Products, Formulation of the substance and its mixtures in batch or continuous operations within closed or contained systems, including incidental exposures during storage, materials transfers, mixing, maintenance, sampling and associated laboratory activities.
Exposure scenario III.	Industrial use, Use of Cosmetics and Personal Care Products, Formulation of the substance and its mixtures in batch or continuous operations within closed or contained systems, including incidental exposures during storage, materials transfers, mixing, maintenance, sampling and associated laboratory activities.
Exposure scenario IV.	Industrial use, Use in adhesives and sealants, Formulation of the substance and its mixtures in batch or continuous operations within closed or contained systems, including incidental exposures during storage, materials transfers, mixing, maintenance, sampling and associated laboratory activities.
Exposure scenario V.	Industrial use, Use in Powder Coatings, Formulation of the substance and its mixtures in batch or continuous operations within closed or contained systems, including incidental exposures during storage, materials transfers, mixing, maintenance, sampling and associated laboratory activities.
Exposure scenario VI.	Industrial use, Use in Paints/Coatings, Formulation of the substance and its mixtures in batch or continuous operations within closed or contained systems, including incidental exposures during storage, materials transfers, mixing, maintenance, sampling and associated laboratory activities.
Exposure scenario VII.	Industrial use, Use in various products (FECC), Formulation of the substance and its mixtures in batch or continuous operations within closed or contained systems, including incidental exposures during storage, materials transfers, mixing, maintenance, sampling and associated laboratory activities.
Exposure scenario VIII.	Professional use, and, Consumer use, Use of Cosmetics and Personal Care Products
Exposure scenario IX.	Industrial use, Manufacture of the substance or use as a process chemical or extraction agent within closed or contained systems. Includes incidental exposures during recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).

Summary

	Process categories	Product category(ies)	Sector(s) of use	Article (sub) category(ies)	Environmental release category(ies)
Formulation of the substance and its mixtures in batch or continuous operations within closed or contained systems, including incidental exposures during storage, materials transfers, mixing, maintenance, sampling and associated laboratory activities.	PROC1 PROC2 PROC3 PROC4 PROC8b PROC8a PROC9 PROC15		SU3 SU8 SU9		ERC1
Industrial use, Use in Washing and Cleaning Products, Formulation of the substance and its mixtures in batch or continuous operations within closed or contained systems, including incidental exposures during storage, materials transfers, mixing, maintenance, sampling and associated laboratory activities.	PROC1 PROC2 PROC3 PROC4 PROC5 PROC8b PROC9 PROC14 PROC15		SU10		ERC2
Industrial use, Use of Cosmetics and Personal Care Products, Formulation of the substance and its mixtures in batch or continuous operations within closed or contained systems, including incidental exposures during storage, materials transfers, mixing, maintenance, sampling and associated laboratory activities.	PROC1 PROC2 PROC3 PROC4 PROC5 PROC8b PROC8a PROC9 PROC14 PROC15		SU10		ERC2
Industrial use, Use in adhesives and sealants, Formulation of the substance and its mixtures in batch or continuous	PROC2 PROC3 PROC4 PROC5		SU10		ERC2

operations within closed or contained systems, including incidental exposures during storage, materials transfers, mixing, maintenance, sampling and associated laboratory activities.	PROC8b PROC9 PROC14 PROC10				
Industrial use, Use in Powder Coatings, Formulation of the substance and its mixtures in batch or continuous operations within closed or contained systems, including incidental exposures during storage, materials transfers, mixing, maintenance, sampling and associated laboratory activities.	PROC1 PROC2 PROC3 PROC5 PROC8b PROC9		SU10		ERC2
Industrial use, Use in Paints/Coatings, Formulation of the substance and its mixtures in batch or continuous operations within closed or contained systems, including incidental exposures during storage, materials transfers, mixing, maintenance, sampling and associated laboratory activities.	PROC1 PROC2 PROC3 PROC5 PROC8b PROC8a PROC9		SU10		ERC2
Industrial use, Use in various products (FECC), Formulation of the substance and its mixtures in batch or continuous operations within closed or contained systems, including incidental exposures during storage, materials transfers, mixing, maintenance, sampling and associated laboratory activities.	PROC1 PROC2 PROC3 PROC4 PROC5 PROC6 PROC8b PROC8a PROC9 PROC14 PROC15		SU10		ERC2, ERC3
Professional use, and, Consumer use, Use of Cosmetics and Personal Care Products	PROC19	PC29, PC39	SU22 SU21		ERC8a
Industrial use, Manufacture of the substance or use as a process chemical or extraction agent within closed or contained systems. Includes incidental exposures during recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).	PROC10 PROC2		SU3 SU6b		ERC5

Exposure scenario I. Formulation of the substance and its mixtures in batch or continuous operations within closed or contained systems, including incidental exposures during storage, materials transfers, mixing, maintenance, sampling and associated laboratory activities.

Section 1: Exposure scenario

Sector(s) of use	SU3: Industrial Manufacturing (all) SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals

List of names of contributing worker scenarios and corresponding PROCs	PROC1. PROC2. PROC3. PROC4. PROC8b. PROC8a. PROC9. PROC15.

Name of contributing environmental scenario and corresponding ERC	ERC1

Section 2: Control of Exposure

Physical form of product:	liquid
Vapour pressure:	0,11 Pa
Process Temperature:	20 °C
Remarks	Not relevant
Concentration of the Substance in Mixture/Article	Covers the percentage of the substance in the product up to 100 % (unless stated differently).

2.1. Control of Human Exposure

Other conditions affecting workers exposure				
Area of use	**Room size**	**Temperature**	**Ventilation rate**	**Remarks**
Indoor use	20 m3	25 °C		Liquid, vapour pressure < 0.5 kPa

Frequency and duration of use	**Duration**	**Frequency of use**	**Remarks**
Exposure time	480 min	5 days/week	

Name of contributing exposure scenario	Risk Management Measures
General exposures, Continuous process, no sampling:	Handle substance within a closed system.
General exposures, Continuous process, with sample collection:	Use suitable eye protection and gloves.
General exposures, Use in contained batch processes, with sample collection:	Use suitable eye protection and gloves.
General exposures, General exposures (open systems):	Use suitable eye protection and gloves.
Bulk transfers:	Use suitable eye protection and gloves.
Equipment cleaning and maintenance:	Use suitable eye protection and gloves.
Drum and small package filling:	Use suitable eye protection and gloves.
Laboratory activities:	Use suitable eye protection and gloves.

2.2.Control of environmental exposure

Risk Management Measures	Note: 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.

Technical measures at process level (source) to prevent release	For further specification, refer to section 8 of the SDS.

Organizational measures to prevent/limit release from the site	None

Environment factors not influenced by risk management	
Flow rate of receiving surface water	18.000 m3/d
Local freshwater dilution factor	10
Local marine water dilution factor	100

ERC1: Manufacture of substances

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Air	Treatment of air emissions is not required for the purposes of REACH compliance but may be needed to comply with other legislation.
Water	All waste water must be processed in an onsite or municipal wastewater treatment plant., Prevent environmental discharge consistent with regulatory requirements. (95 %)

Amounts used: Daily amount per site	35294 kg
Amounts used: Annual amount per site	1200 tonnes/year
Amounts used: Fraction of main source to local environment	1

Msafe	Daily amount per site: 35.294 kg/day

Frequency and duration of use: Continuous process:	340 days/year Emission days

Other given operational conditions affecting environmental exposure

Type:	**Emission days**	**Emission or release factors to the relevant compartments**			**Remarks**
		Air	**Soil**	**Water**	
Continuous release	340	0,001 %	0,01 %	0,05 %	ESVOC spERC 1.1.v1

Conditions and measures related to sewage treatment plant	
Municipal sewage treatment plant:	
Discharge rate	15.000 m3/d
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):86,5 %	

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

Suitable waste treatment	**Treatment effectiveness**	**Remarks**
External treatment and disposal of waste should comply with applicable local and/or national regulations.		
Waste Recovery	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

Section 3. Exposure estimation and reference to its source

3.1.Health:	*When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.*

PROC1: Use in closed process, no likelihood of exposure *General exposures, Continuous process, no sampling*

	Exposure level	RCR	Method	Remarks
Inhalation	0,01 mg/m³	0	ECETOC TRA worker V3	
Dermal	1,37 mg/kg/day	0,03	ECETOC TRA worker V3	
combined routes		0,03	ECETOC TRA worker V3	

PROC2: Use in closed, continuous process with occasional controlled exposure *General exposures, Continuous process, with sample collection*

	Exposure level	RCR	Method	Remarks
Inhalation	0,01 mg/m³	0,00333	ECETOC TRA worker V3	
Dermal	1,37 mg/kg/day	0,02	ECETOC TRA worker V3	
combined routes		0,023	ECETOC TRA worker V3	

PROC3: Use in closed batch process (synthesis or formulation) *General exposures, Use in contained batch processes, with sample collection*

	Exposure level	RCR	Method	Remarks
Inhalation	0,1 mg/m³	0,0333	ECETOC TRA worker V3	
Dermal	0,343 mg/kg/day	0,005	ECETOC TRA worker V3	
combined routes		0,0383	ECETOC TRA worker V3	

PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises *General exposures, General exposures (open systems)*

	Exposure level	RCR	Method	Remarks
Inhalation	0,5 mg/m³	0,166	ECETOC TRA worker V3	
Dermal	6,86 mg/kg/day	0,11	ECETOC TRA worker V3	
combined routes		0,276	ECETOC TRA worker V3	

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities *Bulk transfers*

	Exposure level	RCR	Method	Remarks
Inhalation	0,1 mg/m³	0,0333	ECETOC TRA worker V3	
Dermal	27,4 mg/kg/day	0,438	ECETOC TRA worker V3	
combined routes		0,472	ECETOC TRA worker V3	

PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities *Equipment cleaning and maintenance*

	Exposure level	RCR	Method	Remarks
Inhalation	0,1 mg/m³	0,0333	ECETOC TRA worker V3	
Dermal	6,86 mg/kg/day	0,11	ECETOC TRA worker V3	
combined routes		0,143	ECETOC TRA worker V3	

PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) *Drum and small package filling*

	Exposure level	RCR	Method	Remarks
Inhalation	0,1 mg/m³	0,0333	ECETOC TRA worker V3	
Dermal	0,343 mg/kg/day	0,005	ECETOC TRA worker V3	
combined routes		0,038	ECETOC TRA worker V3	

PROC15: Use as laboratory reagent *Laboratory activities*

	Exposure level	RCR	Method	Remarks
Inhalation	0,1 mg/m³	0,0333	ECETOC TRA worker V3	

Dermal	0,343 mg/kg/day	0,005	ECETOC TRA worker V3	
combined routes		0,038	ECETOC TRA worker V3	

3.2.Environment:	*Used EUSES model. When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.*

ERC1: Manufacture of substances

Compartment	PEC	Risk characterisation ratio (PEC/PNEC):	Method	Remarks
Water	0,0148 mg/l	0,114	EUSES	
Marine water	0,00148 mg/l	0,114	EUSES	
Freshwater sediment	0,2 mg/kg dwt	0,114	EUSES	
Marine sediment	0,02 mg/kg dwt	0,114	EUSES	
Soil	0,0329 mg/kg dwt	0,119	EUSES	
Sewage Treatment Plant	0,148 mg/l	0,0148	EUSES	

Section 4 Guidance to check compliance with the exposure scenario

4.1Health	*Confirm that RMMs and OCs are as described or of equivalent efficiency..*
4.2. Environment	*Further details on scaling and control technologies are provided in SPERC factsheet.ries-libraries.html).*

Scaling: The downstream user can check the compliance of his site by comparing site specific data with defaults used in the exposure assessment. The site specific quotient should be inferior or equal to the spERC quotient.

$$\frac{m_{spERC} * (1 - E_{ER,spERC}) * F_{release,spERC}}{DF_{spERC}} \geq \frac{m_{site} * (1 - E_{ER,site}) * F_{release,site}}{DF_{site}}$$

mspERC: Substance use rate in spERC
EER,spERC: Efficacy of RMM in spERC
Frelease spERC: Initial release fraction in spERC
DFspERC: dilution factor of STP effluent in river
msite: Substance use rate at site
EER,site: Efficacy of RMM at site
Frelease site: Initial release fraction at site
DFsite: dilution factor of STP effluent in river

Exposure scenario II. Industrial use, Use in Washing and Cleaning Products, Formulation of the substance and its mixtures in batch or continuous operations within closed or contained systems, including incidental exposures during storage, materials transfers, mixing, maintenance, sampling and associated laboratory activities.

Section 1: Exposure scenario

Sector(s) of use	SU10: Formulation [mixing] of preparations and/or re-packaging

List of names of contributing worker scenarios and corresponding PROCs	PROC1. PROC2. PROC3. PROC4. PROC5. PROC8b. PROC9. PROC14. PROC15.

Name of contributing environmental scenario and corresponding ERC	ERC2

Section 2: Control of Exposure

Physical form of product:	liquid
Vapour pressure:	0,11 Pa
Process Temperature:	20 °C
Remarks	Not relevant
Concentration of the Substance in Mixture/Article	Covers the percentage of the substance in the product up to 100 % (unless stated differently).

2.1. Control of Human Exposure

Other conditions affecting workers exposure				
Area of use	**Room size**	**Temperature**	**Ventilation rate**	**Remarks**
Indoor use	20 m3	25 °C		Liquid, vapour pressure < 0.5 kPa

Frequency and duration of use	**Duration**	**Frequency of use**	**Remarks**
Exposure time	480 min	5 days/week	

Name of contributing exposure scenario	Risk Management Measures
General exposures, Continuous process, no sampling:	Handle substance within a closed system.
General exposures, Continuous process, with sample collection:	Use suitable eye protection and gloves.
General exposures, Use in contained batch processes, with sample collection:	Use suitable eye protection and gloves.
General exposures, General exposures (open systems):	Use suitable eye protection and gloves.
Mixing operations (open systems):	Use suitable eye protection and gloves.
Bulk transfers:	Use suitable eye protection and gloves.
Drum and small package filling:	Use suitable eye protection and gloves.
Production or preparation or articles by tabletting, compression, extrusion or pelletisation:	Use suitable eye protection and gloves.
Laboratory activities:	Use suitable eye protection and gloves.

2.2.Control of environmental exposure

Risk Management Measures	Note: 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.

Technical measures at process level (source) to prevent release	For further specification, refer to section 8 of the SDS.

Organizational measures to prevent/limit release from the site	None

Environment factors not influenced by risk management	
Flow rate of receiving surface water	18.000 m3/d
Local freshwater dilution factor	10
Local marine water dilution factor	100

ERC2: Formulation of preparations

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Air	Treatment of air emissions is not required for the purposes of REACH compliance but may be needed to comply with other legislation.
Water	Prevent environmental discharge consistent with regulatory requirements., All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.

Amounts used: Daily amount per site	19091 kg
Amounts used: Annual amount per site	4200 tonnes/year
Amounts used: Fraction of main source to local environment	1

Msafe	Daily amount per site: 19.091 kg/day

Frequency and duration of use: Continuous process:	220 days/year Emission days

Other given operational conditions affecting environmental exposure

Type:	**Emission days**	**Emission or release factors to the relevant compartments**			**Remarks**
		Air	**Soil**	**Water**	
Continuous release	220	0 %	0 %	0,1 %	AISE spERC 1-12 were considered for this scenario with AISE spERC 10 selected as the worst case environmental release category.

Conditions and measures related to sewage treatment plant	
Municipal sewage treatment plant:	
Discharge rate	2.000 m3/d
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):86,5 %	

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

Suitable waste treatment	**Treatment effectiveness**	**Remarks**
External treatment and disposal of waste should comply with applicable local and/or national regulations.		
Waste Recovery	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

Section 3. Exposure estimation and reference to its source

3.1.Health:	*When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.*

PROC1: Use in closed process, no likelihood of exposure *General exposures, Continuous process, no sampling*

	Exposure level	RCR	Method	Remarks
Inhalation	0,01 mg/m³	0	ECETOC TRA worker V3	
Dermal	1,37 mg/kg/day	0,03	ECETOC TRA worker V3	
combined routes		0,03	ECETOC TRA worker V3	

PROC2: Use in closed, continuous process with occasional controlled exposure *General exposures, Continuous process, with sample collection*

	Exposure level	RCR	Method	Remarks
Inhalation	0,01 mg/m³	0,00333	ECETOC TRA worker V3	
Dermal	1,37 mg/kg/day	0,02	ECETOC TRA worker V3	
combined routes		0,023	ECETOC TRA worker V3	

PROC3: Use in closed batch process (synthesis or formulation) *General exposures, Use in contained batch processes, with sample collection*

	Exposure level	RCR	Method	Remarks
Inhalation	0,1 mg/m³	0,0333	ECETOC TRA worker V3	
Dermal	0,343 mg/kg/day	0,005	ECETOC TRA worker V3	
combined routes		0,0383	ECETOC TRA worker V3	

PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises *General exposures, General exposures (open systems)*

	Exposure level	RCR	Method	Remarks
Inhalation	0,5 mg/m³	0,166	ECETOC TRA worker V3	
Dermal	6,86 mg/kg/day	0,11	ECETOC TRA worker V3	
combined routes		0,276	ECETOC TRA worker V3	

PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) *Mixing operations (open systems)*

	Exposure level	RCR	Method	Remarks
Inhalation	0,5 mg/m³	0,166	ECETOC TRA worker V3	
Dermal	13,7 mg/kg/day	0,22	ECETOC TRA worker V3	
combined routes		0,386	ECETOC TRA worker V3	

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities *Bulk transfers*

	Exposure level	RCR	Method	Remarks
Inhalation	0,1 mg/m³	0,0333	ECETOC TRA worker V3	
Dermal	27,4 mg/kg/day	0,438	ECETOC TRA worker V3	
combined routes		0,472	ECETOC TRA worker V3	

PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) *Drum and small package filling*

	Exposure level	RCR	Method	Remarks
Inhalation	0,1 mg/m³	0,0333	ECETOC TRA worker V3	
Dermal	0,343 mg/kg/day	0,005	ECETOC TRA worker V3	

combined routes		0,038	ECETOC TRA worker V3	

PROC14: Production of preparations or articles by tabletting, compression, extrusion, pelletisation *Production or preparation or articles by tabletting, compression, extrusion or pelletisation*

	Exposure level	RCR	Method	Remarks
Inhalation	0,1 mg/m³	0,0333	ECETOC TRA worker V3	
Dermal	3,43 mg/kg/day	0,055	ECETOC TRA worker V3	
combined routes		0,0883	ECETOC TRA worker V3	

PROC15: Use as laboratory reagent *Laboratory activities*

	Exposure level	RCR	Method	Remarks
Inhalation	0,1 mg/m³	0,0333	ECETOC TRA worker V3	
Dermal	0,343 mg/kg/day	0,005	ECETOC TRA worker V3	
combined routes		0,038	ECETOC TRA worker V3	

3.2.Environment:	*Used EUSES model. When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.*

ERC2: Formulation of preparations

Compartment	PEC	Risk characterisation ratio (PEC/PNEC):	Method	Remarks
Water	0,12 mg/l	0,922	EUSES	
Marine water	0,012 mg/l	0,922	EUSES	
Freshwater sediment	1,62 mg/kg dwt	0,922	EUSES	
Marine sediment	0,162 mg/kg dwt	0,922	EUSES	
Soil	0,267 mg/kg dwt	0,969	EUSES	
Sewage Treatment Plant	1,2 mg/l	0,12	EUSES	

Section 4 Guidance to check compliance with the exposure scenario

4.1Health	*Confirm that RMMs and OCs are as described or of equivalent efficiency..*
4.2. Environment	*Further details on scaling and control technologies are provided in SPERC factsheet.ries-libraries.html).*

Scaling: The downstream user can check the compliance of his site by comparing site specific data with defaults used in the exposure assessment. The site specific quotient should be inferior or equal to the spERC quotient.

$$\frac{m_{spERC} * (1 - E_{ER,spERC}) * F_{release,spERC}}{DF_{spERC}} \geq \frac{m_{site} * (1 - E_{ER,site}) * F_{release,site}}{DF_{site}}$$

mspERC: Substance use rate in spERC
EER,spERC: Efficacy of RMM in spERC
Frelease spERC: Initial release fraction in spERC
DFspERC: dilution factor of STP effluent in river
msite: Substance use rate at site
EER,site: Efficacy of RMM at site
Frelease site: Initial release fraction at site
DFsite: dilution factor of STP effluent in river

Exposure scenario III. Industrial use, Use of Cosmetics and Personal Care Products, Formulation of the substance and its mixtures in batch or continuous operations within closed or contained systems, including incidental exposures during storage, materials transfers, mixing, maintenance, sampling and associated laboratory activities.

Section 1: Exposure scenario

Sector(s) of use	SU10: Formulation [mixing] of preparations and/or re-packaging

List of names of contributing worker scenarios and corresponding PROCs	PROC1. PROC2. PROC3. PROC4. PROC5. PROC8b. PROC8a. PROC9. PROC14. PROC15.

Name of contributing environmental scenario and corresponding ERC	ERC2

Section 2: Control of Exposure

Physical form of product:	liquid
Vapour pressure:	0,11 Pa
Process Temperature:	20 °C
Remarks	Not relevant
Concentration of the Substance in Mixture/Article	Covers the percentage of the substance in the product up to 100 % (unless stated differently).

2.1. Control of Human Exposure

Other conditions affecting workers exposure				
Area of use	**Room size**	**Temperature**	**Ventilation rate**	**Remarks**
Indoor use	20 m3	25 °C		Liquid, vapour pressure < 0.5 kPa

Frequency and duration of use	**Duration**	**Frequency of use**	**Remarks**
Exposure time	480 min	5 days/week	

Name of contributing exposure scenario	Risk Management Measures
General exposures, Continuous process, no sampling:	Handle substance within a closed system.
General exposures, Continuous process, with sample collection:	Use suitable eye protection and gloves.
General exposures, Use in contained batch processes, with sample collection:	Use suitable eye protection and gloves.
General exposures, General exposures (open systems):	Use suitable eye protection and gloves.
Mixing operations (open systems):	Use suitable eye protection and gloves.
Bulk transfers:	Use suitable eye protection and gloves.
Equipment cleaning and maintenance:	Use suitable eye protection and gloves.
Drum and small package filling:	Use suitable eye protection and gloves.
Production or preparation or articles by tabletting, compression, extrusion or pelletisation:	Use suitable eye protection and gloves.
Laboratory activities:	Use suitable eye protection and gloves.

2.2.Control of environmental exposure

Risk Management Measures	Note: 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.

Technical measures at process level (source) to prevent release	For further specification, refer to section 8 of the SDS.

Organizational measures to prevent/limit release from the site	None

Environment factors not influenced by risk management	
Flow rate of receiving surface water	18.000 m3/d
Local freshwater dilution factor	10
Local marine water dilution factor	100

ERC2: Formulation of preparations

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Air	Treatment of air emissions is not required for the purposes of REACH compliance but may be needed to comply with other legislation.
Water	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments., Prevent environmental discharge consistent with regulatory requirements.

Amounts used: Daily amount per site	1818 kg
Amounts used: Annual amount per site	400 tonnes/year
Amounts used: Fraction of main source to local environment	1

Msafe	Daily amount per site: 1.818 kg/day

Frequency and duration of use: Continuous process:	220 days/year Emission days

Other given operational conditions affecting environmental exposure

Type:	**Emission days**	**Emission or release factors to the relevant compartments**			**Remarks**
		Air	**Soil**	**Water**	
Continuous release	220	0 %	0 %	1 %	COLIPA spERC 1 -16 were considered for this scenario with COLIPA spERC 8 selected as the worst case environmental release category.

Conditions and measures related to sewage treatment plant	
Municipal sewage treatment plant:	
Discharge rate	2.000 m3/d
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):86,5 %	

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

Suitable waste treatment	**Treatment effectiveness**	**Remarks**
External treatment and disposal of waste should comply with applicable local and/or national regulations.		
Waste Recovery	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

Section 3. Exposure estimation and reference to its source

3.1.Health:	*When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.*

PROC1: Use in closed process, no likelihood of exposure *General exposures, Continuous process, no sampling*

	Exposure level	RCR	Method	Remarks
Inhalation	0,01 mg/m³	0	ECETOC TRA worker V3	
Dermal	1,37 mg/kg/day	0,03	ECETOC TRA worker V3	
combined routes		0,03	ECETOC TRA worker V3	

PROC2: Use in closed, continuous process with occasional controlled exposure *General exposures, Continuous process, with sample collection*

	Exposure level	RCR	Method	Remarks
Inhalation	0,01 mg/m³	0,00333	ECETOC TRA worker V3	
Dermal	1,37 mg/kg/day	0,02	ECETOC TRA worker V3	
combined routes		0,023	ECETOC TRA worker V3	

PROC3: Use in closed batch process (synthesis or formulation) *General exposures, Use in contained batch processes, with sample collection*

	Exposure level	RCR	Method	Remarks
Inhalation	0,1 mg/m³	0,0333	ECETOC TRA worker V3	
Dermal	0,343 mg/kg/day	0,005	ECETOC TRA worker V3	
combined routes		0,0383	ECETOC TRA worker V3	

PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises *General exposures, General exposures (open systems)*

	Exposure level	RCR	Method	Remarks
Inhalation	0,5 mg/m³	0,166	ECETOC TRA worker V3	
Dermal	6,86 mg/kg/day	0,11	ECETOC TRA worker V3	
combined routes		0,276	ECETOC TRA worker V3	

PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) *Mixing operations (open systems)*

	Exposure level	RCR	Method	Remarks
Inhalation	0,5 mg/m³	0,166	ECETOC TRA worker V3	
Dermal	13,7 mg/kg/day	0,22	ECETOC TRA worker V3	
combined routes		0,386	ECETOC TRA worker V3	

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities *Bulk transfers*

	Exposure level	RCR	Method	Remarks
Inhalation	0,1 mg/m³	0,0333	ECETOC TRA worker V3	
Dermal	27,4 mg/kg/day	0,438	ECETOC TRA worker V3	
combined routes		0,472	ECETOC TRA worker V3	

PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities *Equipment cleaning and maintenance*

	Exposure level	RCR	Method	Remarks
Inhalation	0,5 mg/m³	0,166	ECETOC TRA worker V3	

Dermal	13,7 mg/kg/day	0,219	ECETOC TRA worker V3	
combined routes		0,386	ECETOC TRA worker V3	

PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) *Drum and small package filling*

	Exposure level	RCR	Method	Remarks
Inhalation	0,1 mg/m³	0,0333	ECETOC TRA worker V3	
Dermal	0,343 mg/kg/day	0,005	ECETOC TRA worker V3	
combined routes		0,038	ECETOC TRA worker V3	

PROC14: Production of preparations or articles by tabletting, compression, extrusion, pelletisation *Production or preparation or articles by tabletting, compression, extrusion or pelletisation*

	Exposure level	RCR	Method	Remarks
Inhalation	0,1 mg/m³	0,0333	ECETOC TRA worker V3	
Dermal	3,43 mg/kg/day	0,055	ECETOC TRA worker V3	
combined routes		0,0883	ECETOC TRA worker V3	

PROC15: Use as laboratory reagent *Laboratory activities*

	Exposure level	RCR	Method	Remarks
Inhalation	0,1 mg/m³	0,0333	ECETOC TRA worker V3	
Dermal	0,343 mg/kg/day	0,005	ECETOC TRA worker V3	
combined routes		0,038	ECETOC TRA worker V3	

3.2.Environment:	*Used EUSES model. When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.*

ERC2: Formulation of preparations

Compartment	PEC	Risk characterisation ratio (PEC/PNEC):	Method	Remarks
Water	0,114 mg/l	0,878	EUSES	
Marine water	0,0114 mg/l	0,878	EUSES	
Freshwater sediment	1,55 mg/kg dwt	0,878	EUSES	
Marine sediment	0,155 mg/kg dwt	0,878	EUSES	
Soil	0,162 mg/kg dwt	0,923	EUSES	
Sewage Treatment Plant	1,14 mg/l	0,114	EUSES	

Section 4 Guidance to check compliance with the exposure scenario

4.1Health	*Confirm that RMMs and OCs are as described or of equivalent efficiency..*
4.2. Environment	*Further details on scaling and control technologies are provided in SPERC factsheet.ries-libraries.html).*

Scaling: The downstream user can check the compliance of his site by comparing site specific data with defaults used in the exposure assessment. The site specific quotient should be inferior or equal to the spERC quotient.

$$\frac{m_{spERC} * (1 - E_{ER,spERC}) * F_{release,spERC}}{DF_{spERC}} \geq \frac{m_{site} * (1 - E_{ER,site}) * F_{release,site}}{DF_{site}}$$

mspERC: Substance use rate in spERC
EER,spERC: Efficacy of RMM in spERC

Frelease spERC: Initial release fraction in spERC
DFspERC: dilution factor of STP effluent in river
msite: Substance use rate at site
EER,site: Efficacy of RMM at site
Frelease site: Initial release fraction at site
DFsite: dilution factor of STP effluent in river

Exposure scenario IV. Industrial use, Use in adhesives and sealants, Formulation of the substance and its mixtures in batch or continuous operations within closed or contained systems, including incidental exposures during storage, materials transfers, mixing, maintenance, sampling and associated laboratory activities.

Section 1: Exposure scenario

Sector(s) of use	SU10: Formulation [mixing] of preparations and/or re-packaging

List of names of contributing worker scenarios and corresponding PROCs	PROC2. PROC3. PROC4. PROC5. PROC8b. PROC9. PROC14. PROC10.

Name of contributing environmental scenario and corresponding ERC	ERC2

Section 2: Control of Exposure

Physical form of product:	liquid
Vapour pressure:	0,11 Pa
Process Temperature:	20 °C
Remarks	Not relevant
Concentration of the Substance in Mixture/Article	Covers the percentage of the substance in the product up to 100 % (unless stated differently).

2.1. Control of Human Exposure

Other conditions affecting workers exposure				
Area of use	**Room size**	**Temperature**	**Ventilation rate**	**Remarks**
Indoor use	20 m3	25 °C		Liquid, vapour pressure < 0.5 kPa

Frequency and duration of use	**Duration**	**Frequency of use**	**Remarks**
Exposure time	480 min	5 days/week	

Name of contributing exposure scenario	Risk Management Measures
General exposures, Continuous process, with sample collection:	Use suitable eye protection and gloves.
General exposures, Use in contained batch processes, with sample collection:	Use suitable eye protection and gloves.
General exposures, General exposures (open systems):	Use suitable eye protection and gloves.
Mixing operations (open systems):	Use suitable eye protection and gloves.
Bulk transfers:	Use suitable eye protection and gloves.
Drum and small package filling:	Use suitable eye protection and gloves.
Production or preparation or articles by tabletting, compression, extrusion or pelletisation:	Use suitable eye protection and gloves.
Rolling, Brushing:	Use suitable eye protection and gloves.

2.2.Control of environmental exposure

Risk Management Measures	Note: 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.

Technical measures at process level (source) to prevent release	For further specification, refer to section 8 of the SDS.

Organizational measures to prevent/limit release from the site	None

Environment factors not influenced by risk management	
Flow rate of receiving surface water	18.000 m3/d
Local freshwater dilution factor	10
Local marine water dilution factor	100

ERC2: Formulation of preparations

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Air	Treatment of air emissions is not required for the purposes of REACH compliance but may be needed to comply with other legislation.
Water	All waste water must be processed in an onsite or municipal wastewater treatment plant., Prevent environmental discharge consistent with regulatory requirements.

Amounts used: Daily amount per site	3636 kg
Amounts used: Annual amount per site	800 tonnes/year
Amounts used: Fraction of main source to local environment	1

Msafe	Daily amount per site: 3.636 kg/day

Frequency and duration of use: Continuous process:	220 days/year Emission days

Other given operational conditions affecting environmental exposure

Type:	**Emission days**	**Emission or release factors to the relevant compartments**			**Remarks**
		Air	**Soil**	**Water**	
Continuous release	220	1 %	0 %	0,5 %	FEICA spERC 1-5 were considered for this scenario with FECIA spERC 5 selected as the worst case environmental release category.

Conditions and measures related to sewage treatment plant	
Municipal sewage treatment plant:	
Discharge rate	2.000 m3/d
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):86,5 %	

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

Suitable waste treatment	**Treatment effectiveness**	**Remarks**
External treatment and disposal of waste should comply with applicable local and/or national regulations.		
Waste Recovery	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

Section 3. Exposure estimation and reference to its source

3.1.Health:	*When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.*

PROC2: Use in closed, continuous process with occasional controlled exposure *General exposures, Continuous process, with sample collection*

	Exposure level	RCR	Method	Remarks
Inhalation	0,01 mg/m³	0,00333	ECETOC TRA worker V3	
Dermal	1,37 mg/kg/day	0,02	ECETOC TRA worker V3	
combined routes		0,023	ECETOC TRA worker V3	

PROC3: Use in closed batch process (synthesis or formulation) *General exposures, Use in contained batch processes, with sample collection*

	Exposure level	RCR	Method	Remarks
Inhalation	0,1 mg/m³	0,0333	ECETOC TRA worker V3	
Dermal	0,343 mg/kg/day	0,005	ECETOC TRA worker V3	
combined routes		0,0383	ECETOC TRA worker V3	

PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises *General exposures, General exposures (open systems)*

	Exposure level	RCR	Method	Remarks
Inhalation	0,5 mg/m³	0,166	ECETOC TRA worker V3	
Dermal	6,86 mg/kg/day	0,11	ECETOC TRA worker V3	
combined routes		0,276	ECETOC TRA worker V3	

PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) *Mixing operations (open systems)*

	Exposure level	RCR	Method	Remarks
Inhalation	0,5 mg/m³	0,166	ECETOC TRA worker V3	
Dermal	13,7 mg/kg/day	0,22	ECETOC TRA worker V3	
combined routes		0,386	ECETOC TRA worker V3	

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities *Bulk transfers*

	Exposure level	RCR	Method	Remarks
Inhalation	0,1 mg/m³	0,0333	ECETOC TRA worker V3	
Dermal	27,4 mg/kg/day	0,438	ECETOC TRA worker V3	
combined routes		0,472	ECETOC TRA worker V3	

PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) *Drum and small package filling*

	Exposure level	RCR	Method	Remarks
Inhalation	0,1 mg/m³	0,0333	ECETOC TRA worker V3	
Dermal	0,343 mg/kg/day	0,005	ECETOC TRA worker V3	
combined routes		0,038	ECETOC TRA worker V3	

PROC14: Production of preparations or articles by tabletting, compression, extrusion, pelletisation *Production or preparation or articles by tabletting, compression, extrusion or pelletisation*

	Exposure level	RCR	Method	Remarks
Inhalation	0,1 mg/m³	0,0333	ECETOC TRA worker V3	
Dermal	3,43 mg/kg/day	0,055	ECETOC TRA worker V3	
combined routes		0,0883	ECETOC TRA worker V3	

PROC10: Roller application or brushing *Rolling, Brushing*

	Exposure level	RCR	Method	Remarks
Inhalation	0,5 mg/m³	0,167	ECETOC TRA worker V3	
Dermal	2,74 mg/kg/day	0,044	ECETOC TRA worker V3	
combined routes		0,21	ECETOC TRA worker V3	

3.2.Environment:	*Used EUSES model. When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.*

ERC2: Formulation of preparations

Compartment	PEC	Risk characterisation ratio (PEC/PNEC):	Method	Remarks
Water	0,114 mg/l	0,878	EUSES	
Marine water	0,0114 mg/l	0,878	EUSES	
Freshwater sediment	1,55 mg/kg dwt	0,878	EUSES	
Marine sediment	0,155 mg/kg dwt	0,878	EUSES	
Soil	0,256 mg/kg dwt	0,929	EUSES	
Sewage Treatment Plant	1,14 mg/l	0,114	EUSES	

Section 4 Guidance to check compliance with the exposure scenario

4.1Health	*Confirm that RMMs and OCs are as described or of equivalent efficiency..*
4.2. Environment	*Further details on scaling and control technologies are provided in SPERC factsheet.ries-libraries.html).*

Scaling: The downstream user can check the compliance of his site by comparing site specific data with defaults used in the exposure assessment. The site specific quotient should be inferior or equal to the spERC quotient.

$$\frac{m_{spERC} * (1 - E_{ER,spERC}) * F_{release,spERC}}{DF_{spERC}} \geq \frac{m_{site} * (1 - E_{ER,site}) * F_{release,site}}{DF_{site}}$$

mspERC: Substance use rate in spERC
EER,spERC: Efficacy of RMM in spERC
Frelease spERC: Initial release fraction in spERC
DFspERC: dilution factor of STP effluent in river
msite: Substance use rate at site
EER,site: Efficacy of RMM at site
Frelease site: Initial release fraction at site
DFsite: dilution factor of STP effluent in river

Exposure scenario V. Industrial use, Use in Powder Coatings, Formulation of the substance and its mixtures in batch or continuous operations within closed or contained systems, including incidental exposures during storage, materials transfers, mixing, maintenance, sampling and associated laboratory activities.

Section 1: Exposure scenario

Sector(s) of use	SU10: Formulation [mixing] of preparations and/or re-packaging

List of names of contributing worker scenarios and corresponding PROCs	PROC1. PROC2. PROC3. PROC5. PROC8b. PROC9.

Name of contributing environmental scenario and corresponding ERC	ERC2

Section 2: Control of Exposure

Physical form of product:	liquid
Vapour pressure:	0,11 Pa
Process Temperature:	20 °C
Remarks	Not relevant
Concentration of the Substance in Mixture/Article	Covers the percentage of the substance in the product up to 100 % (unless stated differently).

2.1. Control of Human Exposure

Other conditions affecting workers exposure				
Area of use	**Room size**	**Temperature**	**Ventilation rate**	**Remarks**
Indoor use	20 m3	25 °C		Liquid, vapour pressure < 0.5 kPa

Frequency and duration of use	**Duration**	**Frequency of use**	**Remarks**
Exposure time	480 min	5 days/week	

Name of contributing exposure scenario	Risk Management Measures
General exposures, Continuous process, no sampling:	Handle substance within a closed system.
General exposures, Continuous process, with sample collection:	Use suitable eye protection and gloves.
General exposures, Use in contained batch processes, with sample collection:	Use suitable eye protection and gloves.
Mixing operations (open systems):	Use suitable eye protection and gloves.
Bulk transfers:	Use suitable eye protection and gloves.
Drum and small package filling:	Use suitable eye protection and gloves.

2.2.Control of environmental exposure

Risk Management Measures	Note: 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.

Technical measures at process level (source) to prevent release	For further specification, refer to section 8 of the SDS.

Organizational measures to prevent/limit release from the site	None

Environment factors not influenced by risk management	
Flow rate of receiving surface water	18.000 m3/d
Local freshwater dilution factor	10
Local marine water dilution factor	100

ERC2: Formulation of preparations

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Air	Treatment of air emissions is not required for the purposes of REACH compliance but may be needed to comply with other legislation.
Water	All waste water must be processed in an onsite or municipal wastewater treatment plant., Prevent environmental discharge consistent with regulatory requirements.

Amounts used: Daily amount per site	3600 kg
Amounts used: Annual amount per site	810 tonnes/year
Amounts used: Fraction of main source to local environment	1

Msafe	Daily amount per site: 3.600 kg/day

Frequency and duration of use: Continuous process:	225 days/year Emission days

Other given operational conditions affecting environmental exposure

Type:	**Emission days**	**Emission or release factors to the relevant compartments**			**Remarks**
		Air	**Soil**	**Water**	
Continuous release	225	0,009 %	0 %	0,5 %	CEPE spERC 1-10 were considered for this scenario with CEPE spERCs 6,7,8 selected as the worst case environmental release categories

Conditions and measures related to sewage treatment plant	
Municipal sewage treatment plant:	
Discharge rate	2.000 m3/d
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):86,5 %	

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

Suitable waste treatment	**Treatment effectiveness**	**Remarks**
External treatment and disposal of waste should comply with applicable local and/or national regulations.		
Waste Recovery	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

Section 3. Exposure estimation and reference to its source

3.1.Health:	*When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.*

PROC1: Use in closed process, no likelihood of exposure *General exposures, Continuous process, no sampling*

	Exposure level	**RCR**	**Method**	**Remarks**
Inhalation	0,01 mg/m³	0	ECETOC TRA worker V3	
Dermal	1,37 mg/kg/day	0,03	ECETOC TRA worker V3	

combined routes		0,03	ECETOC TRA worker V3	

PROC2: Use in closed, continuous process with occasional controlled exposure *General exposures, Continuous process, with sample collection*

	Exposure level	RCR	Method	Remarks
Inhalation	0,01 mg/m³	0,00333	ECETOC TRA worker V3	
Dermal	1,37 mg/kg/day	0,02	ECETOC TRA worker V3	
combined routes		0,023	ECETOC TRA worker V3	

PROC3: Use in closed batch process (synthesis or formulation) *General exposures, Use in contained batch processes, with sample collection*

	Exposure level	RCR	Method	Remarks
Inhalation	0,1 mg/m³	0,0333	ECETOC TRA worker V3	
Dermal	0,343 mg/kg/day	0,005	ECETOC TRA worker V3	
combined routes		0,0383	ECETOC TRA worker V3	

PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) *Mixing operations (open systems)*

	Exposure level	RCR	Method	Remarks
Inhalation	0,5 mg/m³	0,166	ECETOC TRA worker V3	
Dermal	13,7 mg/kg/day	0,22	ECETOC TRA worker V3	
combined routes		0,386	ECETOC TRA worker V3	

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities *Bulk transfers*

	Exposure level	RCR	Method	Remarks
Inhalation	0,1 mg/m³	0,0333	ECETOC TRA worker V3	
Dermal	27,4 mg/kg/day	0,438	ECETOC TRA worker V3	
combined routes		0,472	ECETOC TRA worker V3	

PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) *Drum and small package filling*

	Exposure level	RCR	Method	Remarks
Inhalation	0,1 mg/m³	0,0333	ECETOC TRA worker V3	
Dermal	0,343 mg/kg/day	0,005	ECETOC TRA worker V3	
combined routes		0,038	ECETOC TRA worker V3	

3.2.Environment:	*Used EUSES model. When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.*

ERC2: Formulation of preparations

Compartment	PEC	Risk characterisation ratio (PEC/PNEC):	Method	Remarks
Water	0,113 mg/l	0,870	EUSES	
Marine water	0,0113 mg/l	0,870	EUSES	
Freshwater sediment	1,53 mg/kg dwt	0,870	EUSES	
Marine sediment	0,153 mg/kg dwt	0,870	EUSES	
Soil	0,252 mg/kg dwt	0,913	EUSES	
Sewage Treatment	1,13 mg/l	0,113	EUSES	

Plant				

Section 4 Guidance to check compliance with the exposure scenario

4.1Health	*Confirm that RMMs and OCs are as described or of equivalent efficiency..*
4.2. Environment	*Further details on scaling and control technologies are provided in SPERC factsheet.ries-libraries.html).*

Scaling: The downstream user can check the compliance of his site by comparing site specific data with defaults used in the exposure assessment. The site specific quotient should be inferior or equal to the spERC quotient.

$$\frac{m_{spERC} * (1 - E_{ER,spERC}) * F_{release,spERC}}{DF_{spERC}} \geq \frac{m_{site} * (1 - E_{ER,site}) * F_{release,site}}{DF_{site}}$$

mspERC: Substance use rate in spERC
EER,spERC: Efficacy of RMM in spERC
Frelease spERC: Initial release fraction in spERC
DFspERC: dilution factor of STP effluent in river
msite: Substance use rate at site
EER,site: Efficacy of RMM at site
Frelease site: Initial release fraction at site
DFsite: dilution factor of STP effluent in river

Exposure scenario VI. Industrial use, Use in Paints/Coatings, Formulation of the substance and its mixtures in batch or continuous operations within closed or contained systems, including incidental exposures during storage, materials transfers, mixing, maintenance, sampling and associated laboratory activities.

Section 1: Exposure scenario

Sector(s) of use	SU10: Formulation [mixing] of preparations and/or re-packaging

List of names of contributing worker scenarios and corresponding PROCs	PROC1. PROC2. PROC3. PROC5. PROC8b. PROC8a. PROC9.

Name of contributing environmental scenario and corresponding ERC	ERC2

Section 2: Control of Exposure

Physical form of product:	liquid
Vapour pressure:	0,11 Pa
Process Temperature:	20 °C
Remarks	Not relevant
Concentration of the Substance in Mixture/Article	Covers the percentage of the substance in the product up to 100 % (unless stated differently).

2.1. Control of Human Exposure

Other conditions affecting workers exposure				
Area of use	**Room size**	**Temperature**	**Ventilation rate**	**Remarks**
Indoor use	20 m3	25 °C		Liquid, vapour pressure < 0.5 kPa

Frequency and duration of use	**Duration**	**Frequency of use**	**Remarks**
Exposure time	480 min	5 days/week	

Name of contributing exposure scenario	Risk Management Measures
General exposures, Continuous process, no sampling:	Handle substance within a closed system.
General exposures, Continuous process, with sample collection:	Use suitable eye protection and gloves.
General exposures, Use in contained batch processes, with sample collection:	Use suitable eye protection and gloves.
Mixing operations (open systems):	Use suitable eye protection and gloves.
Bulk transfers:	Use suitable eye protection and gloves.
Equipment cleaning and maintenance:	Use suitable eye protection and gloves.
Drum and small package filling:	Use suitable eye protection and gloves.

2.2.Control of environmental exposure

Risk Management Measures	Note: 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.

Technical measures at process level (source) to prevent release	For further specification, refer to section 8 of the SDS.

Organizational measures to prevent/limit release from the site	None

Environment factors not influenced by risk management	
Flow rate of receiving surface water	18.000 m3/d
Local freshwater dilution factor	10
Local marine water dilution factor	100

ERC2: Formulation of preparations

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Air	Treatment of air emissions is not required for the purposes of REACH compliance but may be needed to comply with other legislation.
Water	All waste water must be processed in an onsite or municipal wastewater treatment plant., Prevent environmental discharge consistent with regulatory requirements.

Amounts used: Daily amount per site	3600 kg
Amounts used: Annual amount per site	810 tonnes/year
Amounts used: Fraction of main source to local environment	1

Msafe	Daily amount per site: 3.600 kg/day

Frequency and duration of use: Continuous process:	225 days/year Emission days

Other given operational conditions affecting environmental exposure

Type:	**Emission days**	**Emission or release factors to the relevant compartments**			**Remarks**
		Air	**Soil**	**Water**	
Continuous release	225	0,009 %	0 %	0,5 %	CEPE spERC 1-10 were considered for this scenario with CEPE spERCs 6,7,8 selected as the worst case environmental release categories

Conditions and measures related to sewage treatment plant	
Municipal sewage treatment plant:	
Discharge rate	2.000 m3/d
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):86,5 %	

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment		
Suitable waste treatment	**Treatment effectiveness**	**Remarks**
External treatment and disposal of waste should comply with applicable local and/or national regulations.		
Waste Recovery	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

Section 3. Exposure estimation and reference to its source

3.1.Health:	*When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.*

PROC1: Use in closed process, no likelihood of exposure *General exposures, Continuous process, no sampling*

	Exposure level	**RCR**	**Method**	**Remarks**

Inhalation	0,01 mg/m³	0	ECETOC TRA worker V3	
Dermal	1,37 mg/kg/day	0,03	ECETOC TRA worker V3	
combined routes		0,03	ECETOC TRA worker V3	

PROC2: Use in closed, continuous process with occasional controlled exposure *General exposures, Continuous process, with sample collection*

	Exposure level	RCR	Method	Remarks
Inhalation	0,01 mg/m³	0,00333	ECETOC TRA worker V3	
Dermal	1,37 mg/kg/day	0,02	ECETOC TRA worker V3	
combined routes		0,023	ECETOC TRA worker V3	

PROC3: Use in closed batch process (synthesis or formulation) *General exposures, Use in contained batch processes, with sample collection*

	Exposure level	RCR	Method	Remarks
Inhalation	0,1 mg/m³	0,0333	ECETOC TRA worker V3	
Dermal	0,343 mg/kg/day	0,005	ECETOC TRA worker V3	
combined routes		0,0383	ECETOC TRA worker V3	

PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) *Mixing operations (open systems)*

	Exposure level	RCR	Method	Remarks
Inhalation	0,5 mg/m³	0,166	ECETOC TRA worker V3	
Dermal	13,7 mg/kg/day	0,22	ECETOC TRA worker V3	
combined routes		0,386	ECETOC TRA worker V3	

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities *Bulk transfers*

	Exposure level	RCR	Method	Remarks
Inhalation	0,1 mg/m³	0,0333	ECETOC TRA worker V3	
Dermal	27,4 mg/kg/day	0,438	ECETOC TRA worker V3	
combined routes		0,472	ECETOC TRA worker V3	

PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities *Equipment cleaning and maintenance*

	Exposure level	RCR	Method	Remarks
Inhalation	0,5 mg/m³	0,166	ECETOC TRA worker V3	
Dermal	13,7 mg/kg/day	0,219	ECETOC TRA worker V3	
combined routes		0,386	ECETOC TRA worker V3	

PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) *Drum and small package filling*

	Exposure level	RCR	Method	Remarks
Inhalation	0,1 mg/m³	0,0333	ECETOC TRA worker V3	
Dermal	0,343 mg/kg/day	0,005	ECETOC TRA worker V3	
combined routes		0,038	ECETOC TRA worker V3	

3.2.Environment:	*Used EUSES model. When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.*

ERC2: Formulation of preparations

Compartment	PEC	Risk characterisation ratio (PEC/PNEC):	Method	Remarks
Water	0,113 mg/l	0,870	EUSES	
Marine water	0,0113 mg/l	0,870	EUSES	
Freshwater sediment	1,53 mg/kg dwt	0,870	EUSES	
Marine sediment	0,153 mg/kg dwt	0,870	EUSES	
Soil	0,252 mg/kg dwt	0,913	EUSES	
Sewage Treatment Plant	1,13 mg/l	0,113	EUSES	

Section 4 Guidance to check compliance with the exposure scenario

4.1Health	*Confirm that RMMs and OCs are as described or of equivalent efficiency..*
4.2. Environment	*Further details on scaling and control technologies are provided in SPERC factsheet.ries-libraries.html).*

Scaling: The downstream user can check the compliance of his site by comparing site specific data with defaults used in the exposure assessment. The site specific quotient should be inferior or equal to the spERC quotient.

$$\frac{m_{spERC} * (1 - E_{ER,spERC}) * F_{release,spERC}}{DF_{spERC}} \geq \frac{m_{site} * (1 - E_{ER,site}) * F_{release,site}}{DF_{site}}$$

mspERC: Substance use rate in spERC
EER,spERC: Efficacy of RMM in spERC
Frelease spERC: Initial release fraction in spERC
DFspERC: dilution factor of STP effluent in river
msite: Substance use rate at site
EER,site: Efficacy of RMM at site
Frelease site: Initial release fraction at site
DFsite: dilution factor of STP effluent in river

Exposure scenario VII. Industrial use, Use in various products (FECC), Formulation of the substance and its mixtures in batch or continuous operations within closed or contained systems, including incidental exposures during storage, materials transfers, mixing, maintenance, sampling and associated laboratory activities.

Section 1: Exposure scenario

Sector(s) of use	SU10: Formulation [mixing] of preparations and/or re-packaging

List of names of contributing worker scenarios and corresponding PROCs	PROC1. PROC2. PROC3. PROC4. PROC5. PROC6. PROC8b. PROC8a. PROC9. PROC14. PROC15.

Name of contributing environmental scenario and corresponding ERC	ERC2 ERC3

Section 2: Control of Exposure

Physical form of product:	liquid
Vapour pressure:	0,11 Pa
Process Temperature:	20 °C
Remarks	Not relevant
Concentration of the Substance in Mixture/Article	Covers the percentage of the substance in the product up to 100 % (unless stated differently).

2.1. Control of Human Exposure

Other conditions affecting workers exposure				
Area of use	**Room size**	**Temperature**	**Ventilation rate**	**Remarks**
Indoor use	20 m3	25 °C		Liquid, vapour pressure < 0.5 kPa

Frequency and duration of use	**Duration**	**Frequency of use**	**Remarks**
Exposure time	480 min	5 days/week	

Name of contributing exposure scenario	Risk Management Measures
General exposures, Continuous process, no sampling:	Handle substance within a closed system.
General exposures, Continuous process, with sample collection:	Use suitable eye protection and gloves.
General exposures, Use in contained batch processes, with sample collection:	Use suitable eye protection and gloves.
General exposures, General exposures (open systems):	Use suitable eye protection and gloves.
Mixing operations (open systems):	Use suitable eye protection and gloves.
Calendering (including Banburys):	Use suitable eye protection and gloves.
Bulk transfers:	Use suitable eye protection and gloves.
Equipment cleaning and maintenance:	Use suitable eye protection and gloves.
Drum and small package filling:	Use suitable eye protection and gloves.
Production or preparation or articles by tabletting, compression, extrusion or pelletisation:	Use suitable eye protection and gloves.
Laboratory activities:	Use suitable eye protection and gloves.

2.2.Control of environmental exposure

Risk Management Measures	Note: 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.

Technical measures at process level (source) to prevent release	For further specification, refer to section 8 of the SDS.

Organizational measures to prevent/limit release from the site	None

Environment factors not influenced by risk management	
Flow rate of receiving surface water	18.000 m3/d
Local freshwater dilution factor	10
Local marine water dilution factor	100

ERC2: Formulation of preparations ERC3: Formulation in materials

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Air	Treatment of air emissions is not required for the purposes of REACH compliance but may be needed to comply with other legislation.
Water	All waste water must be processed in an onsite or municipal wastewater treatment plant., Prevent environmental discharge consistent with regulatory requirements.

Amounts used: Daily amount per site	917 kg
Amounts used: Annual amount per site	275 tonnes/year
Amounts used: Fraction of main source to local environment	1

Msafe	Daily amount per site: 917 kg/day

Frequency and duration of use: Continuous process:	300 days/year Emission days

Other given operational conditions affecting environmental exposure

Type:	**Emission days**	**Emission or release factors to the relevant compartments**			**Remarks**
		Air	**Soil**	**Water**	
Continuous release	300	2,5 %	0 %	2 %	ERC2 default emission rates were selected as the worst case scenario compared to ERC3 emission rates.

Conditions and measures related to sewage treatment plant	
Municipal sewage treatment plant:	
Discharge rate	2.000 m3/d
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):86,5 %	

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

Suitable waste treatment	**Treatment effectiveness**	**Remarks**
External treatment and disposal of waste should comply with applicable local and/or national regulations.		
Waste Recovery	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

Section 3. Exposure estimation and reference to its source

3.1.Health:	*When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.*

PROC1: Use in closed process, no likelihood of exposure *General exposures, Continuous process, no sampling*

	Exposure level	RCR	Method	Remarks
Inhalation	0,01 mg/m³	0	ECETOC TRA worker V3	
Dermal	1,37 mg/kg/day	0,03	ECETOC TRA worker V3	
combined routes		0,03	ECETOC TRA worker V3	

PROC2: Use in closed, continuous process with occasional controlled exposure *General exposures, Continuous process, with sample collection*

	Exposure level	RCR	Method	Remarks
Inhalation	0,01 mg/m³	0,00333	ECETOC TRA worker V3	
Dermal	1,37 mg/kg/day	0,02	ECETOC TRA worker V3	
combined routes		0,023	ECETOC TRA worker V3	

PROC3: Use in closed batch process (synthesis or formulation) *General exposures, Use in contained batch processes, with sample collection*

	Exposure level	RCR	Method	Remarks
Inhalation	0,1 mg/m³	0,0333	ECETOC TRA worker V3	
Dermal	0,343 mg/kg/day	0,005	ECETOC TRA worker V3	
combined routes		0,0383	ECETOC TRA worker V3	

PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises *General exposures, General exposures (open systems)*

	Exposure level	RCR	Method	Remarks
Inhalation	0,5 mg/m³	0,166	ECETOC TRA worker V3	
Dermal	6,86 mg/kg/day	0,11	ECETOC TRA worker V3	
combined routes		0,276	ECETOC TRA worker V3	

PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) *Mixing operations (open systems)*

	Exposure level	RCR	Method	Remarks
Inhalation	0,5 mg/m³	0,166	ECETOC TRA worker V3	
Dermal	13,7 mg/kg/day	0,22	ECETOC TRA worker V3	
combined routes		0,386	ECETOC TRA worker V3	

PROC6: Calendering operations *Calendering (including Banburys)*

	Exposure level	RCR	Method	Remarks
Inhalation	0,1 mg/m³	0,0333	ECETOC TRA worker V3	
Dermal	27,4 mg/kg/day	0,438	ECETOC TRA worker V3	
combined routes		0,472	ECETOC TRA worker V3	

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities *Bulk transfers*

	Exposure level	RCR	Method	Remarks
Inhalation	0,1 mg/m³	0,0333	ECETOC TRA worker V3	

Dermal	27,4 mg/kg/day	0,438	ECETOC TRA worker V3	
combined routes		0,472	ECETOC TRA worker V3	

PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities *Equipment cleaning and maintenance*

	Exposure level	RCR	Method	Remarks
Inhalation	0,5 mg/m³	0,166	ECETOC TRA worker V3	
Dermal	13,7 mg/kg/day	0,219	ECETOC TRA worker V3	
combined routes		0,386	ECETOC TRA worker V3	

PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) *Drum and small package filling*

	Exposure level	RCR	Method	Remarks
Inhalation	0,1 mg/m³	0,0333	ECETOC TRA worker V3	
Dermal	0,343 mg/kg/day	0,005	ECETOC TRA worker V3	
combined routes		0,038	ECETOC TRA worker V3	

PROC14: Production of preparations or articles by tabletting, compression, extrusion, pelletisation *Production or preparation or articles by tabletting, compression, extrusion or pelletisation*

	Exposure level	RCR	Method	Remarks
Inhalation	0,1 mg/m³	0,0333	ECETOC TRA worker V3	
Dermal	3,43 mg/kg/day	0,055	ECETOC TRA worker V3	
combined routes		0,0883	ECETOC TRA worker V3	

PROC15: Use as laboratory reagent *Laboratory activities*

	Exposure level	RCR	Method	Remarks
Inhalation	0,1 mg/m³	0,0333	ECETOC TRA worker V3	
Dermal	0,343 mg/kg/day	0,005	ECETOC TRA worker V3	
combined routes		0,038	ECETOC TRA worker V3	

3.2.Environment:	*Used EUSES model. When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.*

ERC2: Formulation of preparations ERC3: Formulation in materials

Compartment	PEC	Risk characterisation ratio (PEC/PNEC):	Method	Remarks
Water	0,115 mg/l	0,886	EUSES	
Marine water	0,0115 mg/l	0,886	EUSES	
Freshwater sediment	1,56 mg/kg dwt	0,886	EUSES	
Marine sediment	0,156 mg/kg dwt	0,886	EUSES	
Soil	0,258 mg/kg dwt	0,936	EUSES	
Sewage Treatment Plant	1,15 mg/l	0,115	EUSES	

Section 4 Guidance to check compliance with the exposure scenario

4.1Health	*Confirm that RMMs and OCs are as described or of equivalent efficiency..*
4.2. Environment	*Further details on scaling and control technologies are provided in SPERC factsheet.ries-libraries.html).*

Scaling: The downstream user can check the compliance of his site by comparing site specific data with defaults used in the exposure assessment. The site specific quotient should be inferior or equal to the spERC quotient.

$$\frac{m_{spERC} * (1 - E_{ER,spERC}) * F_{release,spERC}}{DF_{spERC}} \geq \frac{m_{site} * (1 - E_{ER,site}) * F_{release,site}}{DF_{site}}$$

mspERC: Substance use rate in spERC
EER,spERC: Efficacy of RMM in spERC
Frelease spERC: Initial release fraction in spERC
DFspERC: dilution factor of STP effluent in river
msite: Substance use rate at site
EER,site: Efficacy of RMM at site
Frelease site: Initial release fraction at site
DFsite: dilution factor of STP effluent in river

Exposure scenario VIII. Professional use, and, Consumer use, Use of Cosmetics and Personal Care Products

Section 1: Exposure scenario

Sector(s) of use	SU22: Public domain (administration, education, entertainment, services, craftsmen) SU21: Private households (=general public = consumers)

List of names of contributing worker scenarios and corresponding PROCs	

Name of contributing environmental scenario and corresponding ERC	ERC8a

Section 2: Control of Exposure

Physical form of product:	liquid
Vapour pressure:	0,00016 Pa
Process Temperature:	25 °C
Remarks	Not relevant
Concentration of the Substance in Mixture/Article	Covers the percentage of the substance in the product up to 100 % (unless stated differently).

2.1. Control of Human Exposure

Name of contributing exposure scenario	Risk Management Measures

PC29, PC39: Pharmaceuticals, Cosmetics, personal care products	Risk Management Measures
	For uses in cosmetics, the exposure scenarios need not address human health aspects because these are addressed under other regulations (Article 14, 5(b) of the Reach Regulation).

2.2.Control of environmental exposure

Risk Management Measures	Note: 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.

Technical measures at process level (source) to prevent release	For further specification, refer to section 8 of the SDS.

Organizational measures to prevent/limit release from the site	None

Environment factors not influenced by risk management	
Flow rate of receiving surface water	Not relevant
Local freshwater dilution factor	Not relevant
Local marine water dilution factor	Not relevant

ERC8a: Wide dispersive indoor use of processing aids in open systems

Amounts used:	This substance is not classified for environmental end-points therefore an environmental risk assessment was not conducted.

Section 3. Exposure estimation and reference to its source

3.1.Health:	*When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.*

PC29, PC39: Pharmaceuticals, Cosmetics, personal care products

None				
				For uses in cosmetics, the exposure scenarios need not address human health aspects because these are addressed under other regulations (Article 14, 5(b) of the Reach Regulation).

3.2.Environment:	*Used EUSES model. When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.*

ERC8a: Wide dispersive indoor use of processing aids in open systems

Compartment	**PEC**	**Risk characterisation ratio (PEC/PNEC):**	**Method**	**Remarks**
				This substance is not classified for environmental end-points therefore an environmental risk assessment was not conducted.

Section 4 Guidance to check compliance with the exposure scenario

4.1Health	*Confirm that RMMs and OCs are as described or of equivalent efficiency..*
4.2. Environment	*Further details on scaling and control technologies are provided in SPERC factsheet.ries-libraries.html).*

Scaling: The downstream user can check the compliance of his site by comparing site specific data with defaults used in the exposure assessment. The site specific quotient should be inferior or equal to the spERC quotient.

$$\frac{m_{spERC} * (1 - E_{ER,spERC}) * F_{release,spERC}}{DF_{spERC}} \geq \frac{m_{site} * (1 - E_{ER,site}) * F_{release,site}}{DF_{site}}$$

mspERC: Substance use rate in spERC
EER,spERC: Efficacy of RMM in spERC
Frelease spERC: Initial release fraction in spERC
DFspERC: dilution factor of STP effluent in river
msite: Substance use rate at site
EER,site: Efficacy of RMM at site
Frelease site: Initial release fraction at site
DFsite: dilution factor of STP effluent in river

Exposure scenario IX. Industrial use, Manufacture of the substance or use as a process chemical or extraction agent within closed or contained systems. Includes incidental exposures during recycling/recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).

Section 1: Exposure scenario

Sector(s) of use	SU3: Industrial Manufacturing (all) SU6b: Manufacture of pulp, paper and paper products

List of names of contributing worker scenarios and corresponding PROCs	PROC10. PROC2.

Name of contributing environmental scenario and corresponding ERC	ERC5

Section 2: Control of Exposure

Physical form of product:	liquid
Vapour pressure:	0,11 Pa
Process Temperature:	20 °C
Remarks	Not relevant
Concentration of the Substance in Mixture/Article	Covers the percentage of the substance in the product up to 100 % (unless stated differently).

2.1. Control of Human Exposure

Other conditions affecting workers exposure				
Area of use	**Room size**	**Temperature**	**Ventilation rate**	**Remarks**
Indoor use	20 m3	25 °C		Liquid, vapour pressure < 0.5 kPa

Frequency and duration of use	**Duration**	**Frequency of use**	**Remarks**
Exposure time	480 min	5 days/week	

Name of contributing exposure scenario	Risk Management Measures
Rolling, Brushing:	Use suitable eye protection and gloves.
General exposures, Continuous process, with sample collection:	Handle substance within a closed system.

2.2.Control of environmental exposure

Risk Management Measures	Note: 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.

Technical measures at process level (source) to prevent release	For further specification, refer to section 8 of the SDS.

Organizational measures to prevent/limit release from the site	None

Environment factors not influenced by risk management	
Flow rate of receiving surface water	Not relevant
Local freshwater dilution factor	Not relevant

Local marine water dilution factor	Not relevant

ERC5: Industrial use resulting in inclusion into or onto a matrix

Amounts used:	This substance is not classified for environmental end-points therefore an environmental risk assessment was not conducted.

Section 3. Exposure estimation and reference to its source

3.1.Health:	*When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.*

PROC10: Roller application or brushing *Rolling, Brushing*

	Exposure level	RCR	Method	Remarks
Inhalation	0,5 mg/m³	0,21	ECETOC TRA worker V3	
Dermal	27,43 mg/kg/day	0,4	ECETOC TRA worker V3	
combined routes		0,61	ECETOC TRA worker V3	

PROC2: Use in closed, continuous process with occasional controlled exposure *General exposures, Continuous process, with sample collection*

	Exposure level	RCR	Method	Remarks
Inhalation	0,01 mg/m³	0	ECETOC TRA worker V3	
Dermal	1,37 mg/kg/day	0,03	ECETOC TRA worker V3	
combined routes		0,03	ECETOC TRA worker V3	

3.2.Environment:	*Used EUSES model. When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.*

ERC5: Industrial use resulting in inclusion into or onto a matrix

Compartment	PEC	Risk characterisation ratio (PEC/PNEC):	Method	Remarks
				This substance is not classified for environmental end-points therefore an environmental risk assessment was not conducted.

Section 4 Guidance to check compliance with the exposure scenario

4.1Health	*Confirm that RMMs and OCs are as described or of equivalent efficiency..*
4.2. Environment	*Further details on scaling and control technologies are provided in SPERC factsheet.ries-libraries.html).*

Scaling: The downstream user can check the compliance of his site by comparing site specific data with defaults used in the exposure assessment. The site specific quotient should be inferior or equal to the spERC quotient.

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mspERC: Substance use rate in spERC
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DFspERC: dilution factor of STP effluent in river

msite: Substance use rate at site
EER,site: Efficacy of RMM at site
Frelease site: Initial release fraction at site
DFsite: dilution factor of STP effluent in river