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

1.1. Product identifier

Product form : Substance

Trade name : Citric Acid Anhydrous Fine Granular 51N
Citric Acid Anhydrous Fine Granular 16/40
Citric Acid Anhydrous Fine Granular 700
Citric Acid Anhydrous Medium Granular 1200
Citric Acid Anhydrous Powder

Chemical name : Citric acid

EC Index : 607-750-00-3

EC-No. : 201-069-1

CAS-No. : 77-92-9

REACH registration No : 01-2119457026-42-0008

Product code : 0432938, 0432962, 0483087, 0482951, 0432717

Synonyms : Citric acid anhydrous; 1,2,3-Propanetricarboxylic acid, 2-hydroxy-; 2-Hydroxy-1,2, / 3-propanetricarboxylic acid; 2-Hydroxypropane-1,2,3-tricarboxylic acid

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

1.2.1. Relevant identified uses

Intended for general public

Main use category : Industrial uses,Professional uses,Consumer use,Detergent & Cleaning products

Use of the substance/mixture : Food additive
Pharmaceutical industry
Cosmetics, personal care products, in industrial applications
Further information: see exposure scenarios attached to this safety data sheet.

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Citribel nv
Pastorijstraat 249
3300 Tienen - Belgium
T +32 16 806600
compliance@citribel.com

1.4. Emergency telephone number

Emergency number : 09.00-17.00 h: +32 16-806600
17.00-09.00 h: +32-16-806669

Country	Official advisory body	Address	Emergency number
Ireland	National Poisons Information Centre Beaumont Hospital	PO Box 1297 Beaumont Road 9 Dublin	+353 1 809 2566 (Healthcare professionals-24/7) +353 1 809 2166 (public, 8am - 10pm, 7/7)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Eye Irrit. 2 H319
STOT SE 3 H335

Full text of H- and EUH-statements: see section 16

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) :

GHS07

Signal word : Warning
Hazard statements (CLP) : H319 - Causes serious eye irritation.
H335 - May cause respiratory irritation.
Precautionary statements (CLP) : P101 - If medical advice is needed, have product container or label at hand.
P102 - Keep out of reach of children.
P261 - Avoid breathing dust.
P264 - Wash hands thoroughly after handling.
P280 - Wear eye protection, face protection.
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313 - If eye irritation persists: Get medical advice/attention.
Listed in Annex VI : EC Index-No.: 607-750-00-3
Child-resistant fastening : Not applicable
Tactile warning : Not applicable

2.3. Other hazards

Other hazards : Dust may form explosive mixture in air. Results of PBT and vPvB assessment : The product does not meet the PBT and vPvB classification criteria.

Contains no PBT/vPvB substances ≥ 0.1% assessed in accordance with REACH Annex XIII

Component	
Citric acid (77-92-9)	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

The substance is not included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605

SECTION 3: Composition/information on ingredients

3.1. Substances

Substance name : Citric acid
CAS-No. : 77-92-9
EC-No. : 201-069-1
EC Index : 607-750-00-3

Substance name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Citric acid	(CAS-No.) 77-92-9 (EC-No.) 201-069-1 (EC Index) 607-750-00-3 (REACH-no) 01-2119457026-42-0008	≥ 99,8	Eye Irrit. 2, H319 STOT SE 3, H335

Full text of H- and EUH-statements: see section 16

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

Additional advice : First aider: Pay attention to self-protection!. Concerning personal protective equipment to use, see section 8. Never give anything by mouth to an unconscious person. In case of doubt or persistent symptoms, consult always a physician. Show this safety data sheet to the doctor in attendance.

Inhalation : Remove casualty to fresh air and keep warm and at rest. Give oxygen or artificial respiration if necessary. In case of doubt or persistent symptoms, consult always a physician. In case of inhalation of high concentrations : Get immediate medical advice/attention.

Skin contact : Remove contaminated clothing and shoes. Gently wash with plenty of soap and water. In case of doubt or persistent symptoms, consult always a physician.

Eyes contact : Rinse immediately carefully and thoroughly with eye-bath or water. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical advice/attention.

Ingestion : Rinse mouth thoroughly with water. Give small amounts of water to drink. Do not induce vomiting without medical advice. In case of loss of conscience place the victim in the recovery position. Get medical advice/attention. On ingestion in large quantities: Get immediate medical advice/attention.

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

Inhalation : May cause respiratory irritation. The following symptoms may occur: Cough. Shortness of breath. Sore throat.

Skin contact : The following symptoms may occur: Contact with dust may cause mechanical irritation or drying of the skin.

Eyes contact : Causes serious eye irritation. The following symptoms may occur: Pain. Irritation. Redness. Tears.

Ingestion : May cause gastrointestinal irritation, nausea, vomiting and diarrhoea.

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

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Water spray. Foam.

Unsuitable extinguishing media : Strong water jet.

5.2. Special hazards arising from the substance or mixture

Specific hazards : Not flammable.

Explosion hazard : Dust may form explosive mixture in air.

Hazardous decomposition products in case of fire : Carbon oxides (CO, CO2).

5.3. Advice for firefighters

Firefighting instructions : Evacuate area. Use water spray or fog for cooling exposed containers. Contain the extinguishing fluids by bunding. Prevent fire fighting water from entering the environment.

Protection during firefighting : Do not attempt to take action without suitable protective equipment. Positive pressure self-contained breathing apparatus (SCBA) and structural fire-fighters protective clothing (EN 469).

Other information : Do not allow run-off from fire-fighting to enter drains or water courses. Dispose of waste in accordance with environmental legislation.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

For non-emergency personnel : Evacuate unnecessary personnel. Keep upwind. Provide adequate ventilation. Wear recommended personal protective equipment. Concerning personal protective equipment to use, see section 8. Do not breathe dust. Avoid contact with skin, eyes and clothing.

6.1.2. For emergency responders

For emergency responders : Ensure procedures and training for emergency decontamination and disposal are in place. Concerning personal protective equipment to use, see section 8.

6.2. Environmental precautions

Do not allow to enter into surface water or drains. Notify authorities if product enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up : Stop leak if safe to do so. Dam up the solid spill. Avoid dust formation. Use only non-sparking tools. Use only explosion-proof equipment. Take up mechanically (sweeping, shovelling) and collect in suitable container for disposal. Clean-up methods - small spillage: Clean up immediately by sweeping or vacuum. Large spills: scoop solid spill into closing containers. This material and its container must be disposed of in a safe way, and as per local legislation.

6.4. Reference to other sections

Concerning personal protective equipment to use, see section 8. Concerning disposal elimination after cleaning, see section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Provide adequate ventilation. Use personal protective equipment as required. Concerning personal protective equipment to use, see section 8. Do not breathe dust. Avoid contact with skin, eyes and clothing. Take any precaution to avoid mixing with Incompatible materials, Refer to Section 10 on Incompatible Materials. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Take precautionary measures against static discharge. Ground/bond container and receiving equipment. Use only non-sparking tools. Use explosion-proof equipment. Ensure proper process control to avoid excess waste discharge (temperature, concentration, pH, time). Avoid release to the environment.

Hygiene measures : Keep good industrial hygiene. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Do not eat, drink or smoke when using this product. Keep away from food, drink and animal feedingstuffs. Remove contaminated clothes. Separate working clothes from town clothes. Launder separately. Wash contaminated clothing before reuse.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store in a dry, cool and well-ventilated place. Protect from heat and direct sunlight. Do not store near or with any of the incompatible materials listed in section 10. Opened containers must be carefully closed and kept upright to avoid leakage.

Storage temperature : 10 – 30 °C

Packaging materials : Keep only in the original container.

7.3. Specific end use(s)

see attached exposure scenario.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Citric acid (77-92-9)		
Czech Republic	PEL (OEL TWA)	4 mg/m³ (dust)
Germany	Occupational exposure limit value (mg/m³) (TRGS900)	2 mg/m³ (the risk of damage to the embryo or fetus can be excluded when AGW and BGW values are observed-inhalable fraction)
Switzerland	MAK (OEL TWA) [1]	2 mg/m³ (inhalable dust)
Switzerland	KZGW (OEL STEL)	4 mg/m³ (inhalable dust)

Citric Acid Anhydrous (77-92-9)	
PNEC (water)	
PNEC aqua (freshwater)	0,44 mg/l
PNEC aqua (marine water)	0,044 mg/l
PNEC (sediment)	
PNEC sediment (freshwater)	34,5 mg/kg dwt
PNEC sediment (marine water)	3,46 mg/kg dwt
PNEC (soil)	
PNEC soil	33,1 mg/kg dwt
PNEC (STP)	
PNEC sewage treatment plant	1000 mg/l

Additional information : Recommended monitoring procedures :. Personal air monitoring. Room air monitoring. Reference :. Workplace atmospheres. Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy. (EN 689). Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents (EN 14042). Workplace exposure - General requirements for the performance of procedures for the measurement of chemical agents (EN 482). Ensure all national/local regulations are observed

8.2. Exposure controls

Engineering measure(s) : Provide adequate ventilation. Organisational measures to prevent /limit releases, dispersion and exposure. Apply measures to prevent dust explosions. See Section 7 for information on safe handling .

Personal protective equipment : The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Hand protection : Wear chemically resistant gloves (tested to EN374) . Suitable material: Nitrile rubber. Thickness > 0,3mm. Breakthrough time : >8h. The quality of the protective gloves resistant to chemicals must be chosen as a function of the specific working place concentration and quantity of hazardous substances.

Eye protection : Use suitable eye protection (EN166): Safety glasses with side shields. tightly fitting safety goggles

Body protection : Wear suitable protective clothing. Impervious clothing. Wear suitable coveralls to prevent exposure to the skin

Respiratory protection : In case of insufficient ventilation, wear suitable respiratory equipment. Effective dust mask (EN 149). Half-face mask (DIN EN 140). full face mask (DIN EN 136). Filter type: P (EN143). The filter class must be suitable for the maximum contaminant concentration (gas/vapour/aerosol/particulates) that may arise when handling the product. If the concentration is exceeded, self-contained breathing apparatus must be used. (EN 137)

Thermal hazard protection : Not required for normal conditions of use. Use dedicated equipment.

Environmental exposure controls : Avoid release to the environment. Comply with applicable Community environmental protection legislation.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Solid
Appearance	: Powder. Granulate.
Molecular weight	: 192,12 g/mol
Colour	: White. Colourless.
Odour	: odourless.
Odour threshold	: No data available
pH	: at 20°C 2.2 at g/l: 10 1.7 at g/l: 100 at 25°C 1.8 at g/l: 50
pH solution	: Not available
Relative evaporation rate (butylacetate=1)	: No data available
Melting / freezing point	: 153 °C

Freezing point	:	No data available
Initial boiling point and boiling range	:	Not applicable - Decomposes before boiling (Decomposition temperature >175°C)
Flash point	:	Not applicable
Auto-ignition temperature	:	1010 °C
Decomposition temperature	:	> 175 °C
Flammability (solid, gas)	:	Non flammable
Vapour pressure	:	1.7 x 10-8 mm Hg (25°C / 77°F) (estimated)
Vapour density	:	No data available
Relative density	:	1,665 (20°C)
Solubility	:	Soluble in: Ethanol. Partially soluble : Diethyl ether. Insoluble in: Benzene. Chloroform. Water: 592 g/l (20°C)
Partition coefficient n-octanol/water	:	-1,72
Kinematic viscosity	:	No data available
Dynamic viscosity	:	2,549 cPs 30 % Aqueous solution (20°C)
Explosive properties	:	Not applicable. The study does not need to be conducted because there are no chemical groups associated with explosive properties present in the molecule.
Oxidising properties	:	Not applicable. The classification procedure needs not to be applied because there are no chemical groups present in the molecule which are associated with oxidising properties.
Explosive limits	:	0,28 – 2,29 kg/m³ (dust)
Particle size	:	Not available
Particle size distribution	:	Not available
Particle shape	:	Not available
Particle aspect ratio	:	Not available
Particle aggregation state	:	Not available
Particle agglomeration state	:	Not available
Particle specific surface area	:	Not available
Particle dustiness	:	Not available

9.2. Other information

9.2.1. Information with regard to physical hazard classes

No additional information available

9.2.2. Other safety characteristics

Relative evaporation rate (butylacetate=1)	:	No data available
Additional information	:	Molecular weight : 192,12 g/mole. Dust class : St(H)1

SECTION 10: Stability and reactivity

10.1. Reactivity

None under normal conditions. Reference to other sections 10.4 & 10.5.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

Dust may form explosive mixture in air.

10.4. Conditions to avoid

Avoid dust formation. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. See Section 7 for information on safe handling.

10.5. Incompatible materials

Oxidising agents. Reducing agent. Strong bases. metals. See Section 7 for information on safe handling.

10.6. Hazardous decomposition products

Reference to other sections 5.2.

SECTION 11: Toxicological information

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

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

Citric acid (77-92-9)	
LD50/oral/rat	3 g/kg
LD50/dermal/rat	> 2000 mg/kg (OECD 402)
LD50, mouse, oral	5400 mg/kg
LD50, mouse, Dermal	2700 mg/kg

Skin corrosion/irritation : Not classified (Based on available data, the classification criteria are not met)
mild skin irritation
rabbit (72h)
pH: at 20°C
2.2 at g/l: 10
1.7 at g/l: 100
at 25°C
1.8 at g/l: 50

Serious eye damage/irritation : Causes serious eye irritation.
rabbit (72h)
pH: at 20°C
2.2 at g/l: 10
1.7 at g/l: 100
at 25°C
1.8 at g/l: 50

Respiratory or skin sensitisation : Not classified (Based on available data, the classification criteria are not met)
No sensitizing reaction was observed for guinea pigs

Germ cell mutagenicity : Not classified (Based on available data, the classification criteria are not met)

Carcinogenicity : Not classified (Based on available data, the classification criteria are not met)
Rat
Oral

Reproductive toxicity : Not classified (Based on available data, the classification criteria are not met)

STOT-single exposure : May cause respiratory irritation.

STOT-repeated exposure : Not classified (Based on available data, the classification criteria are not met)

Citric acid (77-92-9)	
NOAEL, Rat	4000 mg/kg bw/day (10 days)
NOAEL, Rat, Chronic	1200 mg/Kg (2 years)

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

Citric Acid Anhydrous (77-92-9)	
Kinematic viscosity	No data available

Other information : Symptoms related to the physical, chemical and toxicological characteristics. For further information see section 4.

11.2. Information on other hazards

11.2.1. Endocrine disrupting properties

Adverse health effects caused by endocrine disrupting properties : The substance is not included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605

11.2.2 Other information

Other information : Symptoms related to the physical, chemical and toxicological characteristics,For further information see section 4

SECTION 12: Ecological information

12.1. Toxicity

Environmental properties : According to the criteria of the European classification and labelling system, the substance/the product has not to be labelled as "dangerous for the environment".

Hazardous to the aquatic environment, short-term (acute) : Not classified

Hazardous to the aquatic environment, long-term (chronic) : Not classified

Citric acid (77-92-9)	
LC50 - Fish [1]	1516 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus)
LC50 - Fish [2]	440 – 460 mg/l (96h, Leuciscus idus)
EC50 - Crustacea [1]	120 mg/l Daphnia magna (72h)
EC50 - Other aquatic organisms [1]	> 10000 mg/l Pseudomonas putida (16h)

12.2. Persistence and degradability

Citric Acid Anhydrous (77-92-9)	
Persistence and degradability	Readily biodegradable.

Citric acid (77-92-9)	
Persistence and degradability	Readily biodegradable.
Biodegradation	98 % (2 days), 600mg/l) (98%, 7 days) - Inherently biodegradable)

12.3. Bioaccumulative potential

Citric Acid Anhydrous (77-92-9)	
Partition coefficient n-octanol/water	-1,72
Bioaccumulative potential	Low.

Citric acid (77-92-9)	
Bioconcentration factor (BCF)	0,01
Partition coefficient n-octanol/water	-1,72 (at 20 °C)
Bioaccumulative potential	Low potential.

12.4. Mobility in soil

Citric Acid Anhydrous (77-92-9)	
Mobility in soil	No data available

12.5. Results of PBT and vPvB assessment

Component	
Citric acid (77-92-9)	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

12.6. Endocrine disrupting properties

Adverse effects on the environment caused by endocrine disrupting properties : The substance is not included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605

12.7. Other adverse effects

Other adverse effects : No data available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product/Packaging disposal recommendations : Avoid release to the environment. Dispose of empty containers and wastes safely. See Section 7 for information on safe handling. Refer to manufacturer/supplier for information on recovery/recycling. Recycling is preferred to disposal or incineration. If recycling is not possible, eliminate in accordance with local valid waste disposal regulations. Handle contaminated packages in the same way as the substance itself. Dispose of contaminated materials in accordance with current regulations.

European waste catalogue (2001/573/EC, 75/442/EEC, 91/689/EEC) : This material and its container must be disposed of as hazardous waste Waste codes should be assigned by the user, preferably in discussion with the waste disposal authorities

SECTION 14: Transport information

In accordance with ADR / RID / IMDG / IATA / ADN

ADR	IMDG	IATA	ADN	RID
14.1. UN number				
Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
14.2. UN proper shipping name				
Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Not applicable	Not applicable	Not applicable	Not applicable	Not applicable

ADR	IMDG	IATA	ADN	RID
14.3. Transport hazard class(es)				
Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
14.4. Packing group				
Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
14.5. Environmental hazards				
Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
No supplementary information available				

14.6. Special precautions for user

Special precautions for user : No data available

- Overland transport

Not applicable

- Transport by sea

Not applicable

- Air transport

Not applicable

- Inland waterway transport

Not applicable

- Rail transport

Not applicable

14.7. Maritime transport in bulk according to IMO instruments

Code: IBC : No data available.

SECTION 15: Regulatory information

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

15.1.1. EU-Regulations

No REACH Annex XVII restrictions

Citric Acid Anhydrous Fine Granular 51N
Citric Acid Anhydrous Fine Granular 16/40
Citric Acid Anhydrous Fine Granular 700
Citric Acid Anhydrous Medium Granular 1200
Citric Acid Anhydrous Powder is not on the REACH Candidate List

Citric Acid Anhydrous Fine Granular 51N
Citric Acid Anhydrous Fine Granular 16/40
Citric Acid Anhydrous Fine Granular 700
Citric Acid Anhydrous Medium Granular 1200
Citric Acid Anhydrous Powder is not on the REACH Annex XIV List

Seveso Information : Not applicable

15.1.2. National regulations

Listed introduction on Australian Industrial Chemicals Introduction Scheme (AICIS Inventory)
Listed on the Canadian DSL (Domestic Substances List)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)
Switzerland: Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)
Listed on the Japanese ENCS (Existing New Chemical Substances) inventory
Listed on the Japanese ISHL (Industrial Safety and Health Law)
Listed on KECL/KECI (Korean Existing Chemicals Inventory)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on the United States TSCA (Toxic Substances Control Act) inventory
Listed on the Canadian IDL (Ingredient Disclosure List)
Listed on INSQ (Mexican National Inventory of Chemical Substances)
Listed on the TCSI (Taiwan Chemical Substance Inventory)

France

No ICPE	Installations classées Désignation de la rubrique	Code Régime	Rayon
na	Not Applicable	na	na

Germany

Regulatory reference	: WGK 1, Slightly hazardous to water (Classification according to AwSV)
German storage class (LGK)	: LGK 13 - Non-combustible solids
Hazardous Incident Ordinance (12. BImSchV)	: Is not subject of the 12. BImSchV (Hazardous Incident Ordinance)

Netherlands

Waterbezwaarlijkheid	: B (5) - Weinig schadelijk voor in het water levende organismen
SZW-lijst van kankerverwekkende stoffen	: The substance is not listed
SZW-lijst van mutagene stoffen	: The substance is not listed
SZW-lijst van reprotoxische stoffen – Borstvoeding	: The substance is not listed
SZW-lijst van reprotoxische stoffen – Vruchtbaarheid	: The substance is not listed
SZW-lijst van reprotoxische stoffen – Ontwikkeling	: The substance is not listed

Denmark

Classification remarks	: NA

Poland

This safety datasheet has been prepared according to Polish legislation.	: Not applicable

15.2. Chemical safety assessment

A chemical safety assessment has been carried out

SECTION 16: Other information

Indication of changes:

1.1	EC Index	Added	
2.1	Classification according to Regulation (EC) No. 1272/2008 [CLP]	Modified	
2.2	Hazard statements (CLP)	Modified	
2.2	Precautionary statements (CLP)	Modified	
2.3	ED text	Added	
3	Composition/information on ingredients	Modified	
4.2	Inhalation	Modified	
4.3	Indication of any immediate medical attention and special treatment needed	Added	
6.1	For non-emergency personnel	Modified	
7.1	Precautions for safe handling	Modified	
8.2	Respiratory protection	Modified	
9.2	Information with regard to physical hazard classes	Added	
9.2	Other safety characteristics		
11.1	STOT-single exposure	Added	
11.2	Adverse health effects caused by endocrine disrupting properties	Added	
12.6	Adverse effects on the environment caused by endocrine disrupting properties	Added	
14.7	Maritime transport in bulk according to IMO instruments	Added	
	Exposure scenarios	Modified	ES3 Amounts used

Abbreviations and acronyms:

	ABM = Algemene beoordelingsmethodiek
	ADN = Accord Européen relatif au Transport International des Marchandises Dangereuses par voie de Navigation du Rhin ADR = Accord européen relatif au transport international des marchandises Dangereuses par Route CLP = Classification, Labelling and Packaging Regulation according to 1272/2008/EC IATA = International Air Transport Association IMDG = International Maritime Dangerous Goods Code LEL = Lower Explosive Limit/Lower Explosion Limit UEL = Upper Explosion Limit/Upper Explosive Limit REACH = Registration, Evaluation, Authorisation and Restriction of Chemicals
	BTT = Breakthrough time (maximum wearing time)
	DMEL = Derived Minimal Effect level
	DNEL = Derived No Effect Level
	EC50 = Median Effective Concentration
	EL50 = Median effective level

	ErC50 = EC50 in terms of reduction of growth rate
	ErL50 = EL50 in terms of reduction of growth rate
	EWC = European waste catalogue
	LC50 = Median lethal concentration
	LD50 = Median lethal dose
	LL50 = Median lethal level
	NA = Not applicable
	NOEC = No observed effect concentration
	NOEL: no-observed-effect level
	NOELR = No observed effect loading rate
	NOAEC = No observed adverse effect concentration
	NOAEL = No observed adverse effect level
	N.O.S. = Not Otherwise Specified
	OEL = Occupational Exposure Limits - Short Term Exposure Limits (STELs)
	PNEC = Predicted No Effect Concentration
	Quantitative structure-activity relationship (QSAR)
	STOT = Specific Target Organ Toxicity
	TWA = time weighted average
	VOC = Volatile organic compounds
	WGK = Wassergefährdungsklasse (Water Hazard Class under German Federal Water Management Act)

Sources of key data used to compile the datasheet : ECHA (European Chemicals Agency), loli, sds supplier.

Training advice : Training staff on good practice. Manipulations are to be done only by qualified and authorised persons.

Full text of H- and EUH-statements:

Eye Irrit. 2	Serious eye damage/eye irritation, Category 2
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
STOT SE 3	Specific target organ toxicity — Single exposure, Category 3, Respiratory tract irritation

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2020/878
Classification according to Regulation (EC) No. 1272/2008 [CLP]
Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Annex to the safety data sheet

Annex : Identified uses						
Title	**Sector of use**	**Product category**	**Process category**	**Article category**	**Environmental release**	**SPERC**
Manufacture of substance	SU8	PC19	PROC1, PROC2, PROC3, PROC4, PROC8b		ERC1	
Use as an intermediate	SU8, SU9	PC19	PROC1, PROC2, PROC3, PROC4, PROC8b		ERC6a	
Formulation of preparations	SU5, SU10, SU13, SU20	PC1, PC3, PC9a, PC9b, PC9c, PC12, PC18, PC30, PC31, PC35, PC39	PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC13, PROC14, PROC15, PROC19		ERC1, ERC2, ERC3, ERC4	
Personal care	SU20	PC2, PC39	PROC10, PROC11, PROC19	AC8	ERC8a, ERC11a	
Personal care	SU20	PC2, PC39	PROC10, PROC11, PROC19	AC8	ERC8a, ERC11a	
Personal care	SU20	PC2, PC39		AC8	ERC8a, ERC11a	
Use in cleaning agents	SU3	PC3, PC28, PC31, PC35, PC36, PC37	PROC2, PROC4, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13	AC8, AC35	ERC2, ERC4, ERC8a, ERC8b, ERC9a, ERC9b	
Use in cleaning agents	SU3	PC3, PC28, PC31, PC35, PC36, PC37	PROC1, PROC4, PROC8a, PROC9, PROC10, PROC11, PROC13, PROC19	AC8, AC35	ERC2, ERC4, ERC8a, ERC8d, ERC9a, ERC9b	

Use in cleaning agents	SU21	PC3, PC28, PC31, PC35, PC36, PC37		AC8, AC35	ERC8a, ERC8d, ERC9a, ERC9b	
Paper industry	SU6b	PC26	PROC5, PROC8a		ERC4	
construction application	SU2a, SU2b, SU10, SU19		PROC2, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC10, PROC11, PROC13, PROC14, PROC19, PROC21, PROC24	AC4	ERC5, ERC8c, ERC8f, ERC10a, ERC10b, ERC11a, ERC11b, ERC12a	
construction application	SU2a, SU2b, SU10, SU19		PROC2, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC10, PROC11, PROC13, PROC14, PROC19, PROC21, PROC24	AC4	ERC5, ERC8c, ERC8f, ERC10a, ERC10b, ERC11a, ERC11b, ERC12a	
construction application	SU2a, SU2b, SU10, SU19	PC1, PC9b		AC4	ERC8c, ERC8f, ERC10a, ERC10b, ERC11a, ERC11b	
Use in polymer production Manufacture of plastics	SU11, SU12	PC32	PROC3, PROC5, PROC8a, PROC8b		ERC1, ERC6b	
Oil field well drilling and production operations	SU2a, SU2b	PC20, PC40	PROC3, PROC4, PROC5, PROC8a, PROC8b		ERC8d	
textiles	SU5	PC20, PC23, PC34	PROC8a, PROC8b, PROC10, PROC13, PROC22	AC5, AC6	ERC4	
Uses in coatings, Paints	SU17, SU18, SU19	PC9a, PC9b, PC9c, PC18, PC34	PROC7, PROC8a, PROC8b, PROC10,	AC4, AC11	ERC5, ERC8c, ERC8f, ERC10a, ERC10b,	

			PROC11, PROC19, PROC21, PROC24		ERC11a, ERC11b	
Uses in coatings, Paints	SU17, SU18, SU19	PC9a, PC9b, PC18, PC34	PROC7, PROC8a, PROC8b, PROC10, PROC11, PROC19, PROC21, PROC24	AC4, AC11	ERC5, ERC8c, ERC8f, ERC10a, ERC10b, ERC11a, ERC11b	
Uses in coatings, Paints	SU17, SU18, SU19, SU21	PC9a, PC18, PC34		AC4, AC11	ERC8c, ERC8f, ERC10a, ERC10b, ERC11a, ERC11b	
Photographic activities	SU20	PC30	PROC5, PROC9, PROC13		ERC8a	
Photographic activities	SU20	PC30			ERC8a	
Use as laboratory reagent	SU3	PC4, PC16, PC20, PC37	PROC1, PROC2, PROC4, PROC8a		ERC4, ERC7, ERC8f	
Use in water treatment agents	SU14, SU15, SU16, SU17	PC4, PC7, PC14, PC16, PC17, PC20, PC25, PC31, PC35, PC37	PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC17, PROC18, PROC20, PROC23		ERC4, ERC6b, ERC7	
Metal surface treatment products	SU14, SU15, SU16, SU17	PC7, PC14, PC25, PC31, PC35	PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC17, PROC18, PROC23		ERC4, ERC6b	
agriculture	SU1	PC8, PC12, PC21	PROC3, PROC5, PROC8a,		ERC2, ERC4, ERC8b, ERC8d	

			PROC8b, PROC10, PROC11, PROC14, PROC15, PROC19			
agriculture	SU1	PC8, PC12, PC21	PROC3, PROC5, PROC8a, PROC8b, PROC10, PROC11, PROC14, PROC15, PROC19		ERC2, ERC4, ERC8b, ERC8d	
agriculture	SU1	PC8, PC12, PC21			ERC8b, ERC8d	
Medical devices	SU20	PC20	PROC1		ERC7	
Medical devices	SU22	PC20	PROC1		ERC7	
Medical devices	SU21	PC20			ERC7	

1. Exposure scenario 01

Manufacture of substance

ES Ref.: 01 ES Type: Worker Version: 1	

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC8b PC19 SU8 ERC1
Processes, tasks activities covered	Use as an intermediate Use at industrial sites (IS)
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1.1 Contributing scenario controlling worker exposure (PROC1)

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

Product characteristics

Physical form	Crystalline solid, Powder
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)
Other product characteristics	Risk of dust explosion, Irritating

Operational conditions

Frequency and duration of use	Emission days (days/year):	350
	Exposure duration	1 events per day
	Exposure duration	> 4 h

Human factors not influenced by risk management	Body weight:	70 kg Default
	respiration volume (under conditions of use)	10 m³/d Default
	Covers skin contact area up to	Palm of one hand (240cm²)
Other given operational conditions affecting workers exposure	Ventilation control measures	Not applicable.
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Conditions and measures related to personal protection, hygiene and health evaluation	Assumes a good basic standard of occupational hygiene is implemented.	
	Wear protective gloves/protective clothing and eye/face protection.	
	Wear suitable respiratory protection,Effective dust mask	
	In case of insufficient ventilation, wear suitable respiratory equipment,(Dust/Mist),At high concentrations:Use self-contained breathing apparatus	
	For further specification, refer to section 8 of the SDS.	

2.1.2 Contributing scenario controlling worker exposure (PROC2, PROC4)

PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC4	Chemical production where opportunity for exposure arises

Product characteristics

Physical form	Crystalline solid, Powder
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)
Other product characteristics	Risk of dust explosion, Irritating

Operational conditions

Frequency and duration of use	Emission days (days/year):	350
	Exposure duration	1 events per day
	Exposure duration	> 4 h
Human factors not influenced by risk management	Body weight:	70 kg Default
	respiration volume (under conditions of use)	10 m³/d Default
	Covers skin contact area up to	Palms of both hands (480 cm2)
Other given operational conditions affecting workers exposure	with local exhaust ventilation	Local exhaust ventilation - efficiency of at least [%]: 90%
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Conditions and measures related to personal protection, hygiene and health evaluation	Assumes a good basic standard of occupational hygiene is implemented.	
	Wear protective gloves/protective clothing and eye/face protection.	
	Wear suitable respiratory protection,Effective dust mask	
	In case of insufficient ventilation, wear suitable respiratory equipment,(Dust/Mist),At high concentrations:Use self-contained breathing apparatus	
	For further specification, refer to section 8 of the SDS.	

2.1.3 Contributing scenario controlling worker exposure (PROC3)

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

Product characteristics	
Physical form	Crystalline solid, Powder
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)
Other product characteristics	Risk of dust explosion, Irritating

Operational conditions		
Frequency and duration of use	Emission days (days/year):	350
	Exposure duration	1 events per day
	Exposure duration	> 4 h
Human factors not influenced by risk management	Body weight:	70 kg Default
	respiration volume (under conditions of use)	10 m³/d Default
	Covers skin contact area up to	Palm of one hand (240cm²)
Other given operational conditions affecting workers exposure	with local exhaust ventilation	Local exhaust ventilation - efficiency of at least [%]: 90%
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures		
Conditions and measures related to personal protection, hygiene and health evaluation	Assumes a good basic standard of occupational hygiene is implemented.	
	Wear protective gloves/protective clothing and eye/face protection.	
	Wear suitable respiratory protection,Effective dust mask	
	In case of insufficient ventilation, wear suitable respiratory equipment,(Dust/Mist),At high concentrations:Use self-contained breathing apparatus	
	For further specification, refer to section 8 of the SDS.	

2.1.4 Contributing scenario controlling worker exposure (PROC8b)

PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities

Product characteristics	
Physical form	Crystalline solid, Powder
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)
Other product characteristics	Risk of dust explosion, Irritating

Operational conditions		
Frequency and duration of use	Emission days (days/year):	350
	Exposure duration	1 events per day
	Exposure duration	> 4 h
Human factors not influenced by risk management	Body weight:	70 kg Default
	respiration volume (under conditions of use)	10 m³/d Default
	Covers skin contact area up to	Palms of both hands (480 cm2)
Other given operational conditions affecting workers exposure	with local exhaust ventilation	Local exhaust ventilation - efficiency of at least [%]: 95%
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures		
Conditions and measures related to personal protection, hygiene and health evaluation	Assumes a good basic standard of occupational hygiene is implemented.	
	Wear protective gloves/protective clothing and eye/face protection.	
	Wear suitable respiratory protection,Effective dust	

	mask	
	In case of insufficient ventilation, wear suitable respiratory equipment,(Dust/Mist),At high concentrations:Use self-contained breathing apparatus	
	For further specification, refer to section 8 of the SDS.	

2.2 Contributing scenario controlling environmental exposure (ERC1)

ERC1	Manufacture of the substance

Product characteristics

No additional information

Operational conditions

Amount used	Amounts used	100000 t/yr
	Regional use tonnage (tons/year):	10000 t/yr
	Annual site tonnage (tons/year):	10000 t/yr
	Fraction of regional tonnage used locally:	30 tonnes/day
Environmental factors not influenced by risk management	Local freshwater dilution factor:	900
	Local marine water dilution factor:	1000
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0
	Release fraction to wastewater from process (initial release prior to RMM):	0,0001

Risk management measures

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Waste water pretreatment	Neutralisation is necessary before draining of to the purification plant
	Waste water treatment	Central biological waste water treatment
	Assumed on-site sewage treatment plant flow (m3/d):	10000 m³/d
Conditions and measures related to sewage treatment plant	none	
Conditions and measures related to external treatment of waste for disposal	Fraction of used amount transferred to external waste treatment	No specific data
Conditions and measures related to external recovery of waste	Solid waste	Can be landfilled or incinerated, when in compliance with local regulations.
	Recover sludge.	Fertilizers

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1.1	Used ECETOC TRA model (May 2010 release)
2.1.2	Used ECETOC TRA model (May 2010 release)
2.1.3	Used ECETOC TRA model (May 2010 release)
2.1.4	Used ECETOC TRA model (May 2010 release)

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES

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

4.1. Health

Guidance - Health	No data available

4.2. Environment

Guidance - Environment	Predicted exposures are not expected to exceed the PNECs when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

1. Exposure scenario 02

Use as an intermediate

ES Ref.: 02 ES Type: Worker Version: 1	

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC8b PC19 SU8, SU9 ERC6a
Processes, tasks activities covered	Use as an intermediate Manufacture of bulk, large scale chemicals (including petroleum products) Manufacture of fine chemicals Use at industrial sites (IS)
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1.1 Contributing scenario controlling worker exposure (PROC1)

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

Product characteristics

Physical form	Crystalline solid, Powder
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)
Other product characteristics	Risk of dust explosion, Irritating

Operational conditions

Frequency and duration of use	Emission days (days/year):	300
	Exposure duration	1 events per day
	Exposure duration	> 4 h
Human factors not influenced by risk management	Covers skin contact area up to	Palm of one hand (240cm²)
Other given operational conditions affecting workers exposure	Ventilation control measures	Not applicable.
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Conditions and measures related to personal protection, hygiene and health evaluation	Assumes a good basic standard of occupational hygiene is implemented.	
	Wear protective gloves/protective clothing and eye/face protection.	
	Wear suitable respiratory protection,Effective dust mask	
	In case of insufficient ventilation, wear suitable respiratory equipment,(Dust/Mist),At high concentrations:Use self-contained breathing apparatus	
	For further specification, refer to section 8 of the SDS.	

2.1.2 Contributing scenario controlling worker exposure (PROC2)

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

Product characteristics

Physical form	Crystalline solid, Powder
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)
Other product characteristics	Risk of dust explosion, Irritating

Operational conditions		
Frequency and duration of use	Emission days (days/year):	300
	Exposure duration	1 events per day
	Exposure duration	> 4 h
Human factors not influenced by risk management	Covers skin contact area up to	Palms of both hands (480 cm2)
Other given operational conditions affecting workers exposure	with local exhaust ventilation	Local exhaust ventilation - efficiency of at least [%]: 90%
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures		
Conditions and measures related to personal protection, hygiene and health evaluation	Assumes a good basic standard of occupational hygiene is implemented.	
	Wear protective gloves/protective clothing and eye/face protection.	
	Wear suitable respiratory protection,Effective dust mask	
	In case of insufficient ventilation, wear suitable respiratory equipment,(Dust/Mist),At high concentrations:Use self-contained breathing apparatus	
	For further specification, refer to section 8 of the SDS.	

2.1.3 Contributing scenario controlling worker exposure (PROC3)

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

Product characteristics	
Physical form	Crystalline solid, Powder
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)
Other product characteristics	Risk of dust explosion, Irritating

Operational conditions		
Frequency and duration of use	Emission days (days/year):	300
	Exposure duration	1 events per day
	Exposure duration	> 4 h
Human factors not influenced by risk management	Covers skin contact area up to	Palm of one hand (240cm²)
Other given operational conditions affecting workers exposure	with local exhaust ventilation	Local exhaust ventilation - efficiency of at least [%]: 90%
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures		
Conditions and measures related to personal protection, hygiene and health evaluation	Assumes a good basic standard of occupational hygiene is implemented.	
	Wear protective gloves/protective clothing and eye/face protection.	
	Wear suitable respiratory protection,Effective dust mask	
	In case of insufficient ventilation, wear suitable respiratory equipment,(Dust/Mist),At high concentrations:Use self-contained breathing apparatus	
	For further specification, refer to section 8 of the SDS.	

2.1.4 Contributing scenario controlling worker exposure (PROC4)

PROC4	Chemical production where opportunity for exposure arises

Product characteristics	
Physical form	Crystalline solid, Powder

Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)
Other product characteristics	Risk of dust explosion, Irritating

Operational conditions

Frequency and duration of use	Emission days (days/year):	300
	Exposure duration	1 events per day
	Exposure duration	> 4 h
Human factors not influenced by risk management	Covers skin contact area up to	Palms of both hands (480 cm2)
Other given operational conditions affecting workers exposure	with local exhaust ventilation	Local exhaust ventilation - efficiency of at least [%]: 90%
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Conditions and measures related to personal protection, hygiene and health evaluation	Assumes a good basic standard of occupational hygiene is implemented.	
	Wear protective gloves/protective clothing and eye/face protection.	
	Wear suitable respiratory protection,Effective dust mask	
	In case of insufficient ventilation, wear suitable respiratory equipment,(Dust/Mist),At high concentrations:Use self-contained breathing apparatus	
	For further specification, refer to section 8 of the SDS.	

2.1.5 Contributing scenario controlling worker exposure (PROC8b)

PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities

Product characteristics

Physical form	Crystalline solid, Powder
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)
Other product characteristics	Risk of dust explosion, Irritating

Operational conditions

Frequency and duration of use	Emission days (days/year):	300
	Exposure duration	1 events per day
	Exposure duration	> 4 h
Human factors not influenced by risk management	Covers skin contact area up to	Palms of both hands (480 cm2)
Other given operational conditions affecting workers exposure	with local exhaust ventilation	Local exhaust ventilation - efficiency of at least [%]: 95%
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Conditions and measures related to personal protection, hygiene and health evaluation	Assumes a good basic standard of occupational hygiene is implemented.	
	Wear protective gloves/protective clothing and eye/face protection.	
	Wear suitable respiratory protection,Effective dust mask	
	In case of insufficient ventilation, wear suitable respiratory equipment,(Dust/Mist),At high concentrations:Use self-contained breathing apparatus	
	For further specification, refer to section 8 of the SDS.	

2.2 Contributing scenario controlling environmental exposure (ERC6a)

Intermediate

ERC6a	Use of intermediate

Product characteristics

No additional information

Operational conditions

Amount used	Amounts used	100000 t/yr
Other given operational conditions affecting environmental exposure	Not applicable	

Risk management measures

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Waste water pretreatment	Neutralisation is necessary before draining of to the purification plant
	Waste water treatment	Central biological waste water treatment
Conditions and measures related to sewage treatment plant	none	
Conditions and measures related to external treatment of waste for disposal	Fraction of used amount transferred to external waste treatment	No specific data
Conditions and measures related to external recovery of waste	Solid waste	Can be landfilled or incinerated, when in compliance with local regulations.
	Recover sludge.	Fertilizers

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1.1	Used ECETOC TRA model (May 2010 release)
2.1.2	Used ECETOC TRA model (May 2010 release)
2.1.3	Used ECETOC TRA model (May 2010 release)
2.1.4	Used ECETOC TRA model (May 2010 release)
2.1.5	Used ECETOC TRA model (May 2010 release)

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES

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

4.1. Health

Guidance - Health	No data available

4.2. Environment

Guidance - Environment	Predicted exposures are not expected to exceed the PNECs when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

1. Exposure scenario 03

Formulation of preparations

ES Ref.: 03 ES Type: Worker Version: 1	

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC13, PROC14, PROC15, PROC19 PC1, PC3, PC9a, PC9b, PC9c, PC12, PC18, PC30, PC31, PC35, PC39 SU5, SU10, SU13, SU20 ERC1, ERC2, ERC3, ERC4
Processes, tasks activities covered	Adhesives, Sealants Air care products Coatings and paints Fillers and putty thinners Fertilizers Ink and toners Photochemicals Washing and cleaning products (including solvent based products) Cosmetics, personal care products Manufacture of textiles, leather, fur Formulation [mixing] of preparations and/or re-packaging (excluding alloys) Manufacture of other non-metallic mineral products, e.g. plasters, cement Health services Use at industrial sites (IS)
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1.1 Contributing scenario controlling worker exposure (PROC1)

Washing and cleaning products (including solvent based products). Automotive Care (spray, liquid)	
PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Product characteristics

Physical form	Crystalline solid, Powder
Other product characteristics	Risk of dust explosion, Irritating, fugacity, High

Operational conditions

Frequency and duration of use	Emission days (days/year):	300
	Exposure duration	1 events per day
	Exposure duration	> 4 h
Human factors not influenced by risk management	Body weight:	70 kg
	respiration volume (under conditions of use)	10 m³/d
	Covers skin contact area up to	Palm of one hand (240cm²)
Other given operational conditions affecting workers exposure	Local exhaust ventilation	Not applicable.
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Conditions and measures related to personal protection, hygiene and health evaluation	Assumes a good basic standard of occupational hygiene is implemented.	
	Wear protective gloves/protective clothing and eye/face protection.	
	For further specification, refer to section 8 of the SDS.	

2.1.2 Contributing scenario controlling worker exposure (PROC2, PROC4, PROC5, PROC8b, PROC9, PROC14)

Washing and cleaning products (including solvent based products). Automotive Care (spray, liquid)

PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC4	Chemical production where opportunity for exposure arises
PROC5	Mixing or blending in batch processes
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC14	Tabletting, compression, extrusion, pelettisation, granulation

Product characteristics

Physical form	Crystalline solid, Powder
Other product characteristics	Risk of dust explosion, Irritating, fugacity, High

Operational conditions

Frequency and duration of use	Emission days (days/year):	300
	Exposure duration	1 events per day
	Exposure duration	> 4 h
Human factors not influenced by risk management	Body weight:	70 kg
	respiration volume (under conditions of use)	10 m³/d
	Covers skin contact area up to	Palms of both hands (480 cm2)
Other given operational conditions affecting workers exposure	with local exhaust ventilation	Local exhaust ventilation - efficiency of at least [%]: 90%
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Conditions and measures related to personal protection, hygiene and health evaluation	Assumes a good basic standard of occupational hygiene is implemented.	
	Wear protective gloves/protective clothing and eye/face protection.	
	For further specification, refer to section 8 of the SDS.	

2.1.3 Contributing scenario controlling worker exposure (PROC3, PROC15)

Washing and cleaning products (including solvent based products). Automotive Care (spray, liquid)	
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC15	Use as laboratory reagent

Product characteristics

Physical form	Crystalline solid, Powder
Other product characteristics	Risk of dust explosion, Irritating, fugacity, High

Operational conditions

Frequency and duration of use	Emission days (days/year):	300
	Exposure duration	1 events per day
	Exposure duration	> 4 h
Human factors not influenced by risk management	Body weight:	70 kg
	respiration volume (under conditions of use)	10 m³/d
	Covers skin contact area up to	Palm of one hand (240cm²)
Other given operational conditions affecting workers exposure	with local exhaust ventilation	Local exhaust ventilation - efficiency of at least [%]: 90%
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Conditions and measures related to personal protection, hygiene and health evaluation	Assumes a good basic standard of occupational hygiene is implemented.	
	Wear protective gloves/protective clothing and	

	eye/face protection.	
	For further specification, refer to section 8 of the SDS.	

2.1.4 Contributing scenario controlling worker exposure (PROC7)

Washing and cleaning products (including solvent based products). Automotive Care (spray, liquid)	
PROC7	Industrial spraying

Product characteristics

Physical form	Crystalline solid, Powder
Other product characteristics	Risk of dust explosion, Irritating, fugacity, High

Operational conditions

Frequency and duration of use	Emission days (days/year):	300
	Exposure duration	1 events per day
	Exposure duration	> 4 h
Human factors not influenced by risk management	Body weight:	70 kg
	respiration volume (under conditions of use)	10 m³/d
	Covers skin contact area up to	both hands and forearms (1500 cm²)
Other given operational conditions affecting workers exposure	with local exhaust ventilation	Local exhaust ventilation - efficiency of at least [%]: 90%
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Conditions and measures related to personal protection, hygiene and health evaluation	Assumes a good basic standard of occupational hygiene is implemented.	
	Wear protective gloves/protective clothing and eye/face protection.	
	For further specification, refer to section 8 of the SDS.	

2.1.5 Contributing scenario controlling worker exposure (PROC8a)

Washing and cleaning products (including solvent based products). Automotive Care (spray, liquid)	
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities

Product characteristics

Physical form	Crystalline solid, Powder
Other product characteristics	Risk of dust explosion, Irritating, fugacity, High

Operational conditions

Frequency and duration of use	Emission days (days/year):	300
	Exposure duration	1 events per day
	Exposure duration	> 4 h
Human factors not influenced by risk management	Body weight:	70 kg
	respiration volume (under conditions of use)	10 m³/d
	Covers skin contact area up to	Both hands (960 cm²)
Other given operational conditions affecting workers exposure	with local exhaust ventilation	Local exhaust ventilation - efficiency of at least [%]: 90%
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Conditions and measures related to personal protection, hygiene and health evaluation	Assumes a good basic standard of occupational hygiene is implemented.	
	Wear protective gloves/protective clothing and eye/face protection.	
	For further specification, refer to section 8 of the SDS.	

2.1.6 Contributing scenario controlling worker exposure (PROC13)

Washing and cleaning products (including solvent based products). Automotive Care (spray, liquid)	
PROC13	Treatment of articles by dipping and pouring

Product characteristics

Physical form	Crystalline solid, Powder
Other product characteristics	Risk of dust explosion, Irritating, fugacity, Low

Operational conditions

Frequency and duration of use	Emission days (days/year):	300
	Exposure duration	1 events per day
	Exposure duration	> 4 h
Human factors not influenced by risk management	Body weight:	70 kg
	respiration volume (under conditions of use)	10 m³/d
	Covers skin contact area up to	Palms of both hands (480 cm2)
Other given operational conditions affecting workers exposure	with local exhaust ventilation	Local exhaust ventilation - efficiency of at least [%]: 90%
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Conditions and measures related to personal protection, hygiene and health evaluation	Assumes a good basic standard of occupational hygiene is implemented.	
	Wear protective gloves/protective clothing and eye/face protection.	
	For further specification, refer to section 8 of the SDS.	

2.1.7 Contributing scenario controlling worker exposure (PROC19)

Washing and cleaning products (including solvent based products). Automotive Care (spray, liquid)	
PROC19	Manual activities involving hand contact

Product characteristics

Physical form	Crystalline solid, Powder
Other product characteristics	Risk of dust explosion, Irritating, fugacity, Low

Operational conditions

Frequency and duration of use	Emission days (days/year):	300
	Exposure duration	1 events per day
	Exposure duration	> 4 h
Human factors not influenced by risk management	Body weight:	70 kg
	respiration volume (under conditions of use)	10 m³/d
	Covers skin contact area up to	both hands and forearms (1980 cm²)
Other given operational conditions affecting workers exposure	with local exhaust ventilation	Local exhaust ventilation - efficiency of at least [%]: 90%
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Conditions and measures related to personal protection, hygiene and health evaluation	Assumes a good basic standard of occupational hygiene is implemented.	
	Wear protective gloves/protective clothing and eye/face protection.	
	For further specification, refer to section 8 of the SDS.	

2.2 Contributing scenario controlling environmental exposure (ERC1, ERC2, ERC3, ERC4)

Adhesives, sealants. Air care products. Coatings and paints, fillers, putties, thinners. Fertilizers. Ink and Toners. Photochemicals. Polishes and wax blends. Washing and cleaning products (including solvent based products). Cosmetics, personal care products

ERC1	Manufacture of the substance
ERC2	Formulation into mixture
ERC3	Formulation into solid matrix
ERC4	Use of non-reactive processing aid at industrial site (no inclusion into or onto article)

Product characteristics

No additional information

Operational conditions

Amount used	Daily amount per site	20 tonnes/day
	Annual site tonnage (tons/year):	6000 t/yr
Frequency and duration of use	Emission days (days/year):	300 days/year
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,025
	Release fraction to wastewater from process (initial release prior to RMM):	0,02

Risk management measures

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Waste water pretreatment	Neutralisation is necessary before draining of to the purification plant
	Waste water treatment	No specific data
	Assumed on-site sewage treatment plant flow (m3/d):	10000 m³/d
Conditions and measures related to sewage treatment plant	External waste treatment	Applicable
Conditions and measures related to external treatment of waste for disposal	Fraction of used amount transferred to external waste treatment	No specific data
Conditions and measures related to external recovery of waste	Solid waste	Can be landfilled or incinerated, when in compliance with local regulations.
	Recover sludge.	Fertilizers

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1.1	Used ECETOC TRA model (May 2010 release)
2.1.2	Used ECETOC TRA model (May 2010 release)
2.1.3	Used ECETOC TRA model (May 2010 release)
2.1.4	Used ECETOC TRA model (May 2010 release)
2.1.5	Used ECETOC TRA model (May 2010 release)
2.1.6	Used ECETOC TRA model (May 2010 release)
2.1.7	Used ECETOC TRA model (May 2010 release)

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES

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

4.1. Health

Guidance - Health	No data available

4.2. Environment

Guidance - Environment	Predicted exposures are not expected to exceed the PNECs when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

1. Exposure scenario 04a

Personal care

ES Ref.: 04a ES Type: Worker Version: 1	

Use descriptors	PROC10, PROC11, PROC19 PC2, PC39 AC8 SU20 ERC8a, ERC11a
Processes, tasks activities covered	Health services Cosmetics, personal care products Adsorbents Use at industrial sites (IS)
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC10, PROC11, PROC19)

Personal care: Exempted from REACH	
PROC10	Roller application or brushing
PROC11	Non industrial spraying
PROC19	Manual activities involving hand contact

Product characteristics

No additional information

Operational conditions

No additional information

Risk management measures

No additional information

2.2 Contributing scenario controlling environmental exposure (ERC8a, ERC11a)

ERC8a	Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC11a	Widespread use of articles with low release (indoor)

Product characteristics

No additional information

Operational conditions

Amount used	Amounts used	7500000 t/yr
	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	750000 t/yr
	Fraction of regional tonnage used locally:	7500 t/yr
Frequency and duration of use	Emission days (days/year):	365 days/year
Environmental factors not influenced by risk management	Local freshwater dilution factor:	900
	Local marine water dilution factor:	1000
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0
	Release fraction to wastewater from process (initial release prior to RMM):	1

Risk management measures

Conditions and measures related to external recovery of waste	Solid waste	Can be landfilled or incinerated, when in compliance with local regulations.
	Recover sludge.	Fertilizers

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	Not applicable.

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES

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

4.1. Health

Guidance - Health	Not applicable

4.2. Environment

Guidance - Environment	Predicted exposures are not expected to exceed the PNECs when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

1. Exposure scenario 04b

Personal care

ES Ref.: 04b ES Type: Worker Version: 1	

Use descriptors	PROC10, PROC11, PROC19 PC2, PC39 AC8 SU20 ERC8a, ERC11a
Processes, tasks activities covered	Health services Cosmetics, personal care products Adsorbents Widespread use by professional workers (PW)
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC10, PROC11, PROC19)

Personal care: Exempted from REACH	
PROC10	Roller application or brushing
PROC11	Non industrial spraying
PROC19	Manual activities involving hand contact

Product characteristics

No additional information

Operational conditions

No additional information

Risk management measures

No additional information

2.2 Contributing scenario controlling environmental exposure (ERC8a, ERC11a)

ERC8a	Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC11a	Widespread use of articles with low release (indoor)

Product characteristics

No additional information

Operational conditions

Amount used	Amounts used	7500000 t/yr
	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	750000 t/yr
	Fraction of regional tonnage used locally:	7500 t/yr
Frequency and duration of use	Emission days (days/year):	365 days/year
Environmental factors not influenced by risk management	Local freshwater dilution factor:	900
	Local marine water dilution factor:	1000
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0
	Release fraction to wastewater from process (initial release prior to RMM):	1

Risk management measures

Conditions and measures related to external recovery of waste	Solid waste	Can be landfilled or incinerated, when in compliance with local regulations.
	Recover sludge.	Fertilizers

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	Not applicable.

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES

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

4.1. Health

Guidance - Health	Not applicable

4.2. Environment

Guidance - Environment	Predicted exposures are not expected to exceed the PNECs when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

1. Exposure scenario 04c

Personal care

ES Ref.: 04c ES Type: Consumer Version: 1	

Use descriptors	PC2, PC39 AC8 SU20 ERC8a, ERC11a
Processes, tasks activities covered	Consumer uses e.g. as a carrier in cosmetics/personal care products, perfumes and fragrances. Note: For cosmetic and personal care products, risk assessment only required for the environment under REACH as human health is covered by alternative legislation Health services Adsorbents Consumer use (C)
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario consumer end-use (PC2, PC39)

Health services,Adsorbents, Cosmetics, personal care products	
PC2	Adsorbents
PC39	Cosmetics, personal care products

Product characteristics

No additional information

Operational conditions

Other given operational conditions affecting consumers exposure	Exempted : used in cosmetics products and substance not PBT or vPvB	

Risk management measures

Conditions and measures related to information and behavioural advice to consumers	Not applicable	

2.2 Contributing scenario controlling environmental exposure (ERC8a, ERC11a)

Adsorbents, Cosmetics, personal care products No specific risk management measure identified beyond those operational conditions stated.	
ERC8a	Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC11a	Widespread use of articles with low release (indoor)

Product characteristics

No additional information

Operational conditions

Amount used	Annual site tonnage (tons/year):	7500000
Frequency and duration of use	Continuous use/release.	365 days/year
Environmental factors not influenced by risk management	Local freshwater dilution factor:	900
	Local marine water dilution factor:	1000
Other given operational conditions affecting environmental exposure	Fraction of EU tonnage used in region:	10 %
	Regional use tonnage (tons/year):	750000 t/yr
	Fraction of regional tonnage used locally:	7500 t/yr
	Daily amount per site,(average)	1030 kg/day
	Fraction of the main local source	0,0005

Risk management measures

Conditions and measures related to external recovery	Solid waste	Can be landfilled or incinerated, when in

of waste		compliance with local regulations.
	Recover sludge.	Fertilizers

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	Not applicable.

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES

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

4.1. Health

Guidance - Health	Not applicable

4.2. Environment

Guidance - Environment	Predicted exposures are not expected to exceed the PNECs when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

1. Exposure scenario 05a

Use in cleaning agents

ES Ref.: 05a ES Type: Worker Version: 1	

Use descriptors	PROC2, PROC4, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13 PC3, PC28, PC31, PC35, PC36, PC37 AC8, AC35 SU3 ERC2, ERC4, ERC8a, ERC8b, ERC9a, ERC9b
Processes, tasks activities covered	Air care products Automotive Care (spray, liquid) Perfumes, Fragrances Polishes and Wax Blends Washing and cleaning products (including solvent based products) Water softeners Water treatment chemicals Use at industrial sites (IS)
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1.1 Contributing scenario controlling worker exposure (PROC2, PROC4)

Washing and cleaning products (including solvent based products). Automotive Care (spray, liquid)	
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC4	Chemical production where opportunity for exposure arises

Product characteristics

Physical form	Granular solid, Aqueous solution
Concentration of the Substance in Mixture/Article	> 25 %
	Unless otherwise stated
Other product characteristics	fugacity, Low

Operational conditions

Frequency and duration of use	Emission days (days/year):	365
	Exposure duration	1 events per day
	Exposure duration	> 4 h
Other given operational conditions affecting workers exposure	Local exhaust ventilation	Not applicable.
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Conditions and measures related to personal protection, hygiene and health evaluation	Assumes a good basic standard of occupational hygiene is implemented.	
	Wear gloves,Safety glasses,Wear work clothes with long sleeves.	
	For further specification, refer to section 8 of the SDS.	

2.1.2 Contributing scenario controlling worker exposure (PROC7)

Washing and cleaning products (including solvent based products). Automotive Care (spray, liquid)	
PROC7	Industrial spraying

Product characteristics

Physical form	Granular solid, Aqueous solution
Concentration of the Substance in Mixture/Article	> 25 %
	Unless otherwise stated

Other product characteristics	fugacity, High

Operational conditions

Frequency and duration of use	Emission days (days/year):	365
	Exposure duration	1 events per day
	Exposure duration	> 4 h
Human factors not influenced by risk management	Covers skin contact area up to	both hands and forearms (1500 cm²)
Other given operational conditions affecting workers exposure	with local exhaust ventilation	Local exhaust ventilation - efficiency of at least [%]: 95%
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Conditions and measures related to personal protection, hygiene and health evaluation	Assumes a good basic standard of occupational hygiene is implemented.	
	Wear gloves,Safety glasses,Wear work clothes with long sleeves.	
	For further specification, refer to section 8 of the SDS.	

2.1.3 Contributing scenario controlling worker exposure (PROC8a, PROC10)

Washing and cleaning products (including solvent based products). Automotive Care (spray, liquid)	
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC10	Roller application or brushing

Product characteristics

Physical form	Granular solid, Aqueous solution
Concentration of the Substance in Mixture/Article	> 25 %
	Unless otherwise stated
Other product characteristics	fugacity, Low

Operational conditions

Frequency and duration of use	Emission days (days/year):	365
	Exposure duration	1 events per day
	Exposure duration	> 4 h
Human factors not influenced by risk management	Covers skin contact area up to	Both hands (960 cm²)
Other given operational conditions affecting workers exposure	Local exhaust ventilation	Not applicable.
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Conditions and measures related to personal protection, hygiene and health evaluation	Assumes a good basic standard of occupational hygiene is implemented.	
	Wear gloves,Safety glasses,Wear work clothes with long sleeves.	
	For further specification, refer to section 8 of the SDS.	

2.1.4 Contributing scenario controlling worker exposure (PROC8b, PROC9, PROC13)

Washing and cleaning products (including solvent based products). Automotive Care (spray, liquid)	
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC13	Treatment of articles by dipping and pouring

Product characteristics

Physical form	Granular solid, Aqueous solution
Concentration of the Substance in Mixture/Article	> 25 %
	Unless otherwise stated
Other product characteristics	fugacity, Low

Operational conditions

Frequency and duration of use	Emission days (days/year):	365
	Exposure duration	1 events per day
	Exposure duration	> 4 h
Human factors not influenced by risk management	Covers skin contact area up to	Palms of both hands (480 cm2)
Other given operational conditions affecting workers exposure	Local exhaust ventilation	Not applicable.
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Conditions and measures related to personal protection, hygiene and health evaluation	Assumes a good basic standard of occupational hygiene is implemented.	
	Wear gloves,Safety glasses,Wear work clothes with long sleeves.	
	For further specification, refer to section 8 of the SDS.	

2.2 Contributing scenario controlling environmental exposure (ERC2, ERC4, ERC8a, ERC8b, ERC9a, ERC9b)

ERC2	Formulation into mixture
ERC4	Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ERC8a	Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC8b	Widespread use of reactive processing aid (no inclusion into or onto article, indoor)
ERC9a	Widespread use of functional fluid (indoor)
ERC9b	Widespread use of functional fluid (outdoor)

Product characteristics

Other product characteristics	Readily biodegradable

Operational conditions

Amount used	Amounts used	100000 t/yr
Other given operational conditions affecting environmental exposure	Not applicable	

Risk management measures

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Waste water pretreatment	Neutralisation is necessary before draining of to the purification plant
	Waste water treatment	Central biological waste water treatment
Conditions and measures related to sewage treatment plant	none	
Conditions and measures related to external treatment of waste for disposal	Fraction of used amount transferred to external waste treatment	No specific data
Conditions and measures related to external recovery of waste	Solid waste	Can be landfilled or incinerated, when in compliance with local regulations.
	Recover sludge.	Fertilizers

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1.1	Used ECETOC TRA model (May 2010 release)
2.1.2	Used ECETOC TRA model (May 2010 release)
2.1.3	Used ECETOC TRA model (May 2010 release)
2.1.4	Used ECETOC TRA model (May 2010 release)

3.2. Environment

Information for contributing exposure scenario

2.2	EUSES

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

4.1. Health

Guidance - Health	No data available

4.2. Environment

Guidance - Environment	Predicted exposures are not expected to exceed the PNECs when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

1. Exposure scenario 05b

Use in cleaning agents

ES Ref.: 05b ES Type: Worker Version: 1	

Use descriptors	PROC1, PROC4, PROC8a, PROC9, PROC10, PROC11, PROC13, PROC19 PC3, PC28, PC31, PC35, PC36, PC37 AC8, AC35 SU3 ERC2, ERC4, ERC8a, ERC8d, ERC9a, ERC9b
Processes, tasks activities covered	Air care products Automotive Care (spray, liquid) Perfumes, Fragrances Polishes and Wax Blends Washing and cleaning products (including solvent based products) Water softeners Water treatment chemicals Widespread use by professional workers (PW)
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1.1 Contributing scenario controlling worker exposure (PROC1, PROC4, PROC13)

Washing and cleaning products (including solvent based products). Automotive Care (spray, liquid)	
PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC4	Chemical production where opportunity for exposure arises
PROC13	Treatment of articles by dipping and pouring

Product characteristics

Physical form	Granular solid, Aqueous solution
Concentration of the Substance in Mixture/Article	> 25 %
	Unless otherwise stated
Other product characteristics	fugacity, Low

Operational conditions

Amount used	Daily amount per site	10 kg
Frequency and duration of use	Emission days (days/year):	365
	Exposure duration	1 events per day
	Exposure duration	15 minutes Laundry and dish washing products
	Exposure duration	30 minutes Automotive Care (spray, liquid)
Human factors not influenced by risk management	Body weight:	70 kg Default
	respiration volume (under conditions of use)	10 m³/d Default
Other given operational conditions affecting workers exposure	Liquid	Control of pH value.
	Granular solid	On application, the product does not form dust.
	Local exhaust ventilation	Not applicable.

Risk management measures

Technical conditions and measures to control dispersion from the source towards the worker	Not applicable	

2.1.2 Contributing scenario controlling worker exposure (PROC8a, PROC10)

Washing and cleaning products (including solvent based products). Automotive Care (spray, liquid)	
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC10	Roller application or brushing

Product characteristics

Physical form	Granular solid, Aqueous solution
Concentration of the Substance in Mixture/Article	> 25 %
	Unless otherwise stated
Other product characteristics	fugacity, Low

Operational conditions

Amount used	Daily amount per site	10 kg
Frequency and duration of use	Emission days (days/year):	365
	Exposure duration	1 events per day
	Exposure duration	15 minutes Laundry and dish washing products
	Exposure duration	30 minutes Automotive Care (spray, liquid)
Human factors not influenced by risk management	Body weight:	70 kg Default
	respiration volume (under conditions of use)	10 m³/d Default
	Covers skin contact area up to	Both hands (960 cm²)
Other given operational conditions affecting workers exposure	Liquid	Control of pH value.
	Granular solid	On application, the product does not form dust.
	Local exhaust ventilation	Not applicable.

Risk management measures

Technical conditions and measures to control dispersion from the source towards the worker	Not applicable	

2.1.3 Contributing scenario controlling worker exposure (PROC9)

Washing and cleaning products (including solvent based products). Automotive Care (spray, liquid)	
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Product characteristics

Physical form	Granular solid, Aqueous solution
Concentration of the Substance in Mixture/Article	> 25 %
	Unless otherwise stated
Other product characteristics	fugacity, Low

Operational conditions

Amount used	Daily amount per site	10 kg
Frequency and duration of use	Emission days (days/year):	365
	Exposure duration	1 events per day
	Exposure duration	15 minutes Laundry and dish washing products
	Exposure duration	30 minutes Automotive Care (spray, liquid)
Human factors not influenced by risk management	Body weight:	70 kg Default
	respiration volume (under conditions of use)	10 m³/d Default
	Covers skin contact area up to	Palms of both hands (480 cm2)
Other given operational conditions affecting workers	Liquid	Control of pH value.

exposure	Granular solid	On application, the product does not form dust.
	Local exhaust ventilation	Not applicable.

Risk management measures

Technical conditions and measures to control dispersion from the source towards the worker	Not applicable	

2.1.4 Contributing scenario controlling worker exposure (PROC11)

Washing and cleaning products (including solvent based products). Automotive Care (spray, liquid)	
PROC11	Non industrial spraying

Product characteristics

Physical form	Granular solid, Aqueous solution
Concentration of the Substance in Mixture/Article	> 25 %
	Unless otherwise stated
Other product characteristics	fugacity, Low

Operational conditions

Amount used	Daily amount per site	10 kg
Frequency and duration of use	Emission days (days/year):	365
	Exposure duration	1 events per day
	Exposure duration	15 minutes Laundry and dish washing products
	Exposure duration	30 minutes Automotive Care (spray, liquid)
Human factors not influenced by risk management	Body weight:	70 kg Default
	respiration volume (under conditions of use)	10 m³/d Default
	Covers skin contact area up to	both hands and forearms (1500 cm²)
Other given operational conditions affecting workers exposure	Liquid	Control of pH value.
	Granular solid	On application, the product does not form dust.
	Local exhaust ventilation	Not applicable.

Risk management measures

Technical conditions and measures to control dispersion from the source towards the worker	Not applicable	

2.1.5 Contributing scenario controlling worker exposure (PROC19)

Washing and cleaning products (including solvent based products). Automotive Care (spray, liquid)	
PROC19	Manual activities involving hand contact

Product characteristics

Physical form	Granular solid, Aqueous solution
Concentration of the Substance in Mixture/Article	> 25 %
	Unless otherwise stated
Other product characteristics	fugacity, Low

Operational conditions

Amount used	Daily amount per site	10 kg
Frequency and duration of use	Emission days (days/year):	365
	Exposure duration	1 events per day
	Exposure duration	15 minutes Laundry and dish washing products
	Exposure duration	30 minutes Automotive Care (spray, liquid)

Human factors not influenced by risk management	Body weight:	70 kg Default
	respiration volume (under conditions of use)	10 m³/d Default
	Covers skin contact area up to	both hands and forearms (1980 cm²)
Other given operational conditions affecting workers exposure	Liquid	Control of pH value.
	Granular solid	On application, the product does not form dust.
	Local exhaust ventilation	Not applicable.

Risk management measures

Technical conditions and measures to control dispersion from the source towards the worker	Not applicable	

2.2 Contributing scenario controlling environmental exposure (ERC2, ERC4, ERC8a, ERC8d, ERC9a, ERC9b)

ERC2	Formulation into mixture
ERC4	Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ERC8a	Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC8d	Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
ERC9a	Widespread use of functional fluid (indoor)
ERC9b	Widespread use of functional fluid (outdoor)

Product characteristics

Other product characteristics	Readily biodegradable

Operational conditions

Amount used	Amounts used	100000 t/yr
Other given operational conditions affecting environmental exposure	Not applicable	

Risk management measures

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Not applicable	
Conditions and measures related to sewage treatment plant	none	
Conditions and measures related to external treatment of waste for disposal	Not applicable.	
Conditions and measures related to external recovery of waste	Not applicable.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1.1	Used ECETOC TRA model (May 2010 release)
2.1.2	Used ECETOC TRA model (May 2010 release)
2.1.3	Used ECETOC TRA model (May 2010 release)
2.1.4	Used ECETOC TRA model (May 2010 release)
2.1.5	Used ECETOC TRA model (May 2010 release)

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES

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

4.1. Health

Guidance - Health	No data available

4.2. Environment

Guidance - Environment	Predicted exposures are not expected to exceed the PNECs when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

1. Exposure scenario 05c

Use in cleaning agents

ES Ref.: 05c ES Type: Consumer Version: 1	

Use descriptors	PC3, PC28, PC31, PC35, PC36, PC37 AC8, AC35 SU21 ERC8a, ERC8d, ERC9a, ERC9b
Processes, tasks activities covered	Air care products Automotive Care (spray, liquid) Perfumes, Fragrances Polishes and Wax Blends Washing and cleaning products (including solvent based products) Water softeners Water treatment chemicals Consumer use (C)
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario consumer end-use (PC3, PC28, PC31, PC35, PC36, PC37)

Washing and cleaning products (including solvent based products), Automotive Care (spray, liquid)	
PC3	Air care products
PC28	Perfumes, fragrances
PC31	Polishes and wax blends
PC35	Washing and cleaning products (including solvent based products)
PC36	Water softeners
PC37	Water treatment chemicals

Product characteristics

Physical form	Granular solid, Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %, Unless otherwise stated

Operational conditions

Human factors not influenced by risk management	Covers skin contact area up to	Both hands (960 cm²)
Other given operational conditions affecting consumers exposure	respiration volume (under conditions of use)	26 m³ Default values: Cleaning and washing/laundry products/detergent liquids
	Covers use in room size of {0}.	20 m³
	Body weight:	65 kg Default values: Cleaning and washing/laundry products/detergent liquids
	Ventilation rate per hour	0,6
	Liquids,Aqueous solution	Control of pH value.
	Granular solid	On application, the product does not form dust.

Risk management measures

Conditions and measures related to information and behavioural advice to consumers	Not applicable	

2.2 Contributing scenario controlling environmental exposure (ERC8a, ERC8d, ERC9a, ERC9b)

Coatings and paints, thinners, paint removers, Ink and Toners, Textile dyes, finishing and impregnating products; including bleaches and other processing aids No specific risk management measure identified beyond those operational conditions stated.	
ERC8a	Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)

ERC8d	Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
ERC9a	Widespread use of functional fluid (indoor)
ERC9b	Widespread use of functional fluid (outdoor)

Product characteristics

Other product characteristics	Readily biodegradable

Operational conditions

Amount used	Annual site tonnage (tons/year):	100000
Frequency and duration of use	Continuous use/release.	365 days/year
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Fraction of EU tonnage used in region:	10 %
	Regional use tonnage (tons/year):	10000 t/yr
	Fraction of regional tonnage used locally:	200 t/yr
	Annual site tonnage (tons/year):	0,01 t/d
	Fraction of the main local source	0,0005

Risk management measures

Conditions and measures related to external recovery of waste	Solid waste	Can be landfilled or incinerated, when in compliance with local regulations.
	Recover sludge.	Fertilizers

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	No data available

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES

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

4.1. Health

Guidance - Health	No data available

4.2. Environment

Guidance - Environment	Predicted exposures are not expected to exceed the PNECs when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

1. Exposure scenario 06

Paper industry

ES Ref.: 06 ES Type: Worker Version: 1	

Use descriptors	PROC5, PROC8a PC26 SU6b ERC4
Processes, tasks activities covered	Paper and board treatment products Manufacture of wood and wood products Manufacture of pulp, paper and paper products Use at industrial sites (IS)
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure

Mixing or blending in batch processes, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities

Paper and board treatment products

Product characteristics

Physical form	Liquid, Aqueous solution

Operational conditions

Other given operational conditions affecting workers exposure	Provide adequate ventilation	
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Conditions and measures related to personal protection, hygiene and health evaluation	Assumes a good basic standard of occupational hygiene is implemented.	
	Wear protective gloves/protective clothing and eye/face protection.	
	Wear suitable respiratory protection,Effective dust mask	
	In case of insufficient ventilation, wear suitable respiratory equipment,At high concentrations:Use self-contained breathing apparatus	
	For further specification, refer to section 8 of the SDS.	

2.2 Contributing scenario controlling environmental exposure (ERC4)

Mixing or blending in batch processes, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities

Paper and board treatment products

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

Product characteristics

No additional information

Operational conditions

Amount used	Amounts used	1000 t/yr
Frequency and duration of use	Continuous use/release.	300 days/year
Other given operational conditions affecting environmental exposure	Release fraction to wastewater from wide dispersive use:	67 kg/day

Risk management measures

Conditions and measures related to sewage treatment plant	Municipal sewage treatment plant	Applicable
	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	No data available

3.2. Environment

Information for contributing exposure scenario	
2.2	No data available

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

4.1. Health

Guidance - Health	No data available

4.2. Environment

Guidance - Environment	Predicted exposures are not expected to exceed the PNECs when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

1. Exposure scenario 07a

construction application

ES Ref.: 07a ES Type: Worker Version: 1	

Use descriptors	PROC2, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC10, PROC11, PROC13, PROC14, PROC19, PROC21, PROC24 AC4 SU2a, SU2b, SU10, SU19 ERC5, ERC8c, ERC8f, ERC10a, ERC10b, ERC11a, ERC11b, ERC12a
Processes, tasks activities covered	Building and construction preparations not covered elsewhere. Formulation [mixing] of preparations and/or re-packaging (excluding alloys) Building and construction work Use at industrial sites (IS)
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC2, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC10, PROC11, PROC13, PROC14, PROC19, PROC21, PROC24)

Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions. Chemical production where opportunity for exposure arises. Mixing or blending in batch processes. Industrial spraying. Transfer of substance or mixture (charging and discharging) at non-dedicated facilities. Transfer of substance or mixture (charging and discharging) at dedicated facilities. Roller application or brushing. Non industrial spraying. Treatment of articles by dipping and pouring. tabletting, compression, extrusion or pelletisation. Manual activities involving hand contact. Low energy manipulation and handling of substances bound in/on materials or articles. High (mechanical) energy work-up of substances bound in /on materials and/or articles

Building and construction preparations not covered elsewhere.

PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC4	Chemical production where opportunity for exposure arises
PROC5	Mixing or blending in batch processes
PROC7	Industrial spraying
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC10	Roller application or brushing
PROC11	Non industrial spraying
PROC13	Treatment of articles by dipping and pouring
PROC14	Tabletting, compression, extrusion, pelettisation, granulation
PROC19	Manual activities involving hand contact
PROC21	Low energy manipulation and handling of substances bound in/on materials or articles
PROC24	High (mechanical) energy work-up of substances bound in /on materials and/or articles

Product characteristics

Physical form	Liquid, Aqueous solution
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 1 %, Unless otherwise stated

Operational conditions

Other given operational conditions affecting workers exposure	Provide adequate ventilation	
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Conditions and measures related to personal protection, hygiene and health evaluation	Assumes a good basic standard of occupational hygiene is implemented.	
	Wear protective gloves/protective clothing and eye/face protection.	

	Wear suitable respiratory protection,Effective dust mask	
	In case of insufficient ventilation, wear suitable respiratory equipment,(Dust/Mist),At high concentrations:Use self-contained breathing apparatus	
	For further specification, refer to section 8 of the SDS.	

2.2 Contributing scenario controlling environmental exposure (ERC5, ERC8c, ERC8f, ERC10a, ERC10b, ERC11a, ERC11b, ERC12a)

Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions. Chemical production where opportunity for exposure arises. Mixing or blending in batch processes. Industrial spraying. Transfer of substance or mixture (charging and discharging) at non-dedicated facilities. Transfer of substance or mixture (charging and discharging) at dedicated facilities. Roller application or brushing. Non industrial spraying. Treatment of articles by dipping and pouring. tabletting, compression, extrusion or pelletisation. Manual activities involving hand contact. Low energy manipulation and handling of substances bound in/on materials or articles. High (mechanical) energy work-up of substances bound in /on materials and/or articles

Building and construction preparations not covered elsewhere.

ERC5	Use at industrial site leading to inclusion into/onto article
ERC8c	Widespread use leading to inclusion into/onto article (indoor)
ERC8f	Widespread use leading to inclusion into/onto article (outdoor)
ERC10a	Widespread use of articles with low release (outdoor)
ERC10b	Widespread use of articles with high or intended release (outdoor)
ERC11a	Widespread use of articles with low release (indoor)
ERC11b	Widespread use of articles with high or intended release (indoor)
ERC12a	Processing of articles at industrial sites with low release

Product characteristics

No additional information

Operational conditions

Amount used	Amounts used	1500 t/yr
Frequency and duration of use	Continuous use/release.	365 days/year
Other given operational conditions affecting environmental exposure	Release fraction to soil from wide dispersive use (regional only):	3699 kg/day Regional information
	Release fraction to wastewater from wide dispersive use:	411 kg/day

Risk management measures

Conditions and measures related to sewage treatment plant	Municipal sewage treatment plant	Applicable
	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	No data available

3.2. Environment

Information for contributing exposure scenario	
2.2	No data available

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

4.1. Health

Guidance - Health	No data available

4.2. Environment

Guidance - Environment	Predicted exposures are not expected to exceed the PNECs when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

1. Exposure scenario 07b

construction application

ES Ref.: 07b ES Type: Worker Version: 1	

Use descriptors	PROC2, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC10, PROC11, PROC13, PROC14, PROC19, PROC21, PROC24 AC4 SU2a, SU2b, SU10, SU19 ERC5, ERC8c, ERC8f, ERC10a, ERC10b, ERC11a, ERC11b, ERC12a
Processes, tasks activities covered	Building and construction preparations not covered elsewhere. Formulation [mixing] of preparations and/or re-packaging (excluding alloys) Building and construction work Widespread use by professional workers (PW)
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC2, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC10, PROC11, PROC13, PROC14, PROC19, PROC21, PROC24)

Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions. Chemical production where opportunity for exposure arises. Mixing or blending in batch processes. Industrial spraying. Transfer of substance or mixture (charging and discharging) at non-dedicated facilities. Transfer of substance or mixture (charging and discharging) at dedicated facilities. Roller application or brushing. Non industrial spraying. Treatment of articles by dipping and pouring. tabletting, compression, extrusion or pelletisation. Manual activities involving hand contact. Low energy manipulation and handling of substances bound in/on materials or articles. High (mechanical) energy work-up of substances bound in /on materials and/or articles

Building and construction preparations not covered elsewhere.

PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC4	Chemical production where opportunity for exposure arises
PROC5	Mixing or blending in batch processes
PROC7	Industrial spraying
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC10	Roller application or brushing
PROC11	Non industrial spraying
PROC13	Treatment of articles by dipping and pouring
PROC14	Tabletting, compression, extrusion, pelettisation, granulation
PROC19	Manual activities involving hand contact
PROC21	Low energy manipulation and handling of substances bound in/on materials or articles
PROC24	High (mechanical) energy work-up of substances bound in /on materials and/or articles

Product characteristics

Physical form	Liquid, Granular solid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 1 %, Unless otherwise stated

Operational conditions

Other given operational conditions affecting workers exposure	Liquids	Control of pH value.
	Granular solid	On application, the product does not form dust.

Risk management measures

Technical conditions and measures at process level to prevent release	Not applicable	
Conditions and measures related to personal protection, hygiene and health evaluation	For further specification, refer to section 8 of the SDS.	

2.2 Contributing scenario controlling environmental exposure (ERC5, ERC8c, ERC8f, ERC10a, ERC10b, ERC11a, ERC11b, ERC12a)

Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions. Chemical production where opportunity for exposure arises. Mixing or blending in batch processes. Industrial spraying. Transfer of substance or mixture (charging and discharging) at non-dedicated facilities. Transfer of substance or mixture (charging and discharging) at dedicated facilities. Roller application or brushing. Non industrial spraying. Treatment of articles by dipping and pouring. tabletting, compression, extrusion or pelletisation. Manual activities involving hand contact. Low energy manipulation and handling of substances bound in/on materials or articles. High (mechanical) energy work-up of substances bound in /on materials and/or articles

Building and construction preparations not covered elsewhere.

ERC5	Use at industrial site leading to inclusion into/onto article
ERC8c	Widespread use leading to inclusion into/onto article (indoor)
ERC8f	Widespread use leading to inclusion into/onto article (outdoor)
ERC10a	Widespread use of articles with low release (outdoor)
ERC10b	Widespread use of articles with high or intended release (outdoor)
ERC11a	Widespread use of articles with low release (indoor)
ERC11b	Widespread use of articles with high or intended release (indoor)
ERC12a	Processing of articles at industrial sites with low release

Product characteristics

No additional information

Operational conditions

Amount used	Amounts used	1500 t/yr
Frequency and duration of use	Continuous use/release.	365 days/year
Other given operational conditions affecting environmental exposure	Not applicable	

Risk management measures

Conditions and measures related to sewage treatment plant	Municipal sewage treatment plant	Not applicable

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	No data available

3.2. Environment

Information for contributing exposure scenario	
2.2	No data available

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

4.1. Health

Guidance - Health	No data available

4.2. Environment

Guidance - Environment	Predicted exposures are not expected to exceed the PNECs when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

1. Exposure scenario 07c

construction application

ES Ref.: 07c ES Type: Consumer Version: 1	

Use descriptors	PC1, PC9b AC4 SU2a, SU2b, SU10, SU19 ERC8c, ERC8f, ERC10a, ERC10b, ERC11a, ERC11b
Processes, tasks activities covered	Building and construction work Formulation [mixing] of preparations and/or re-packaging (excluding alloys) Mining (without offshore industries) Consumer use (C)
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario consumer end-use (PC1, PC9b)

Building and construction preparations not covered elsewhere. Constructional articles and building material for indoor use: wall construction material, ceramic, metal, plastic and wood construction material, insulating material. Constructional articles and building material for outdoor use: wall construction material, road surface material, ceramic, metal, plastic and wood construction material, insulating material.	
PC1	Adhesives, sealants
PC9b	Fillers, putties, plasters, modelling clay

Product characteristics

Physical form	Granular solid, Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 1 %, Unless otherwise stated

Operational conditions

Other given operational conditions affecting consumers exposure	Indoor and outdoor use.	
	Liquids	Control of pH value.
	Granular solid	On application, the product does not form dust.

Risk management measures

Conditions and measures related to information and behavioural advice to consumers	Not applicable	

2.2 Contributing scenario controlling environmental exposure (ERC8c, ERC8f, ERC10a, ERC10b, ERC11a, ERC11b)

Building and construction preparations not covered elsewhere.	
ERC8c	Widespread use leading to inclusion into/onto article (indoor)
ERC8f	Widespread use leading to inclusion into/onto article (outdoor)
ERC10a	Widespread use of articles with low release (outdoor)
ERC10b	Widespread use of articles with high or intended release (outdoor)
ERC11a	Widespread use of articles with low release (indoor)
ERC11b	Widespread use of articles with high or intended release (indoor)

Product characteristics

No additional information

Operational conditions

Amount used	Annual site tonnage (tons/year):	1500
Frequency and duration of use	Continuous use/release.	365 days/year

Risk management measures

No additional information

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	No data available

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES

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

4.1. Health

Guidance - Health	No data available

4.2. Environment

Guidance - Environment	Predicted exposures are not expected to exceed the PNECs when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

1. Exposure scenario 08

Use in polymer production
Manufacture of plastics

ES Ref.: 08 ES Type: Worker Version: 1	

Use descriptors	PROC3, PROC5, PROC8a, PROC8b PC32 SU11, SU12 ERC1, ERC6b
Processes, tasks activities covered	Polymer preparations and compounds Manufacture of rubber products Manufacture of plastics products, including compounding and conversion Use at industrial sites (IS)
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC3, PROC5, PROC8a, PROC8b)

Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition. Mixing or blending in batch processes. Transfer of substance or mixture (charging and discharging) at non-dedicated facilities. Transfer of substance or mixture (charging and discharging) at dedicated facilities

Polymer preparations and compounds

PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC5	Mixing or blending in batch processes
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities

Product characteristics

Physical form	Liquid, Aqueous solution
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 1 %, unless stated differently

Operational conditions

Other given operational conditions affecting workers exposure	Provide adequate ventilation	
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Conditions and measures related to personal protection, hygiene and health evaluation	Assumes a good basic standard of occupational hygiene is implemented.	
	Wear protective gloves/protective clothing and eye/face protection.	
	Wear suitable respiratory protection,Effective dust mask	
	In case of insufficient ventilation, wear suitable respiratory equipment,(Dust/Mist),At high concentrations:Use self-contained breathing apparatus	
	For further specification, refer to section 8 of the SDS.	

2.2 Contributing scenario controlling environmental exposure (ERC1, ERC6b)

Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition. Mixing or blending in batch processes. Transfer of substance or mixture (charging and discharging) at non-dedicated facilities. Transfer of substance or mixture (charging and discharging) at dedicated facilities

Polymer preparations and compounds

ERC1	Manufacture of the substance
ERC6b	Use of reactive processing aid at industrial site (no inclusion into or onto article)

Product characteristics

No additional information

Operational conditions

Amount used	Amounts used	200 t/yr
Frequency and duration of use	Continuous use/release.	300 days/year
Other given operational conditions affecting environmental exposure	Release fraction to wastewater from wide dispersive use:	0,35 kg/day Regional information
	Release fraction to wastewater from wide dispersive use:	3,18 kg/day Europe
	Release fraction to air from wide dispersive use (regional only):	0

Risk management measures

Conditions and measures related to sewage treatment plant	Municipal sewage treatment plant	Applicable
	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	No data available

3.2. Environment

Information for contributing exposure scenario	
2.2	No data available

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

4.1. Health

Guidance - Health	No data available

4.2. Environment

Guidance - Environment	Predicted exposures are not expected to exceed the PNECs when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

1. Exposure scenario 09

Oil field well drilling and production operations

ES Ref.: 09 ES Type: Worker Version: 1	

Use descriptors	PROC3, PROC4, PROC5, PROC8a, PROC8b PC20, PC40 SU2a, SU2b ERC8d
Processes, tasks activities covered	Use in mining chemicals Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents Extraction agents Use at industrial sites (IS)
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC3, PROC4, PROC5, PROC8a, PROC8b)

Transfer of substance or mixture (charging and discharging) at non-dedicated facilities. Transfer of substance or mixture (charging and discharging) at dedicated facilities. Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition. Chemical production where opportunity for exposure arises. Mixing or blending in batch processes

Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents. Extraction agents

PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4	Chemical production where opportunity for exposure arises
PROC5	Mixing or blending in batch processes
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities

Product characteristics

Physical form	Liquid, Aqueous solution
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)

Operational conditions

Other given operational conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Conditions and measures related to personal protection, hygiene and health evaluation	Assumes a good basic standard of occupational hygiene is implemented.	
	Wear protective gloves/protective clothing and eye/face protection.	
	Wear suitable respiratory protection,Effective dust mask	
	In case of insufficient ventilation, wear suitable respiratory equipment,(Dust/Mist),At high concentrations:Use self-contained breathing apparatus	
	For further specification, refer to section 8 of the SDS.	

2.2 Contributing scenario controlling environmental exposure (ERC8d)

Transfer of substance or mixture (charging and discharging) at non-dedicated facilities. Transfer of substance or mixture (charging and discharging) at dedicated facilities. Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition. Chemical production where opportunity for exposure arises. Mixing or blending in batch processes

Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents. Extraction agents

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

Product characteristics

No additional information

Operational conditions

Amount used	Amounts used	1000 t/yr
Frequency and duration of use	Continuous use/release.	365 days/year
Other given operational conditions affecting environmental exposure	Release fraction to wastewater from wide dispersive use:	274 kg/day Regional information
	Release fraction to wastewater from wide dispersive use:	2470 kg/day Europe

Risk management measures

Conditions and measures related to sewage treatment plant	Municipal sewage treatment plant	Applicable
	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	No data available

3.2. Environment

Information for contributing exposure scenario	
2.2	No data available

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

4.1. Health

Guidance - Health	No data available

4.2. Environment

Guidance - Environment	Predicted exposures are not expected to exceed the PNECs when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

1. Exposure scenario 10

textiles

ES Ref.: 10 ES Type: Worker Version: 1	

Use descriptors	PROC8a, PROC8b, PROC10, PROC13, PROC22 PC20, PC23, PC34 AC5, AC6 SU5 ERC4
Processes, tasks activities covered	Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents Leather treatment products Textile dyes, finishing and impregnating products Manufacture of textiles, leather, fur Use at industrial sites (IS)
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC8a, PROC8b, PROC10, PROC13, PROC22)

Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents. Leather treatment products. Textile dyes, finishing and impregnating products; including bleaches and other processing aids	
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC10	Roller application or brushing
PROC13	Treatment of articles by dipping and pouring
PROC22	Manufacturing and processing of minerals and/or metals at substantially elevated temperature

Product characteristics

Physical form	Solid, Aqueous solution
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)

Operational conditions

Frequency and duration of use	Emission days (days/year):	300 Continuous use/release.
Human factors not influenced by risk management	Body weight:	70 kg (Default)
	respiration volume (under conditions of use)	10 m³/d
Other given operational conditions affecting workers exposure	Provide adequate ventilation	
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Conditions and measures related to personal protection, hygiene and health evaluation	Assumes a good basic standard of occupational hygiene is implemented.	
	Wear protective gloves/protective clothing and eye/face protection.	
	Wear suitable respiratory protection,Effective dust mask	
	In case of insufficient ventilation, wear suitable respiratory equipment,(Dust/Mist),At high concentrations:Use self-contained breathing apparatus	
	For further specification, refer to section 8 of the SDS.	

2.2 Contributing scenario controlling environmental exposure (ERC4)

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

Product characteristics

Other product characteristics	Readily biodegradable

Operational conditions

Amount used	Amounts used	300 t/yr
Frequency and duration of use	Continuous use/release.	365 days/year
Other given operational conditions affecting environmental exposure	Not applicable	

Risk management measures

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Waste water pretreatment	Neutralisation is necessary before draining of to the purification plant
	Waste water treatment	No specific data
	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.	
Conditions and measures related to sewage treatment plant	Municipal sewage treatment plant	Applicable
Conditions and measures related to external treatment of waste for disposal	Fraction of used amount transferred to external waste treatment	No specific data
Conditions and measures related to external recovery of waste	Solid waste	Can be landfilled or incinerated, when in compliance with local regulations.
	Recover sludge.	Fertilizers

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	Used ECETOC TRA model (May 2010 release)

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES

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

4.1. Health

Guidance - Health	No data available

4.2. Environment

Guidance - Environment	Predicted exposures are not expected to exceed the PNECs when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

1. Exposure scenario 11a

Uses in coatings, Paints

ES Ref.: 11a ES Type: Worker Version: 1	

Use descriptors	PROC7, PROC8a, PROC8b, PROC10, PROC11, PROC19, PROC21, PROC24 PC9a, PC9b, PC9c, PC18, PC34 AC4, AC11 SU17, SU18, SU19 ERC5, ERC8c, ERC8f, ERC10a, ERC10b, ERC11a, ERC11b
Processes, tasks activities covered	Coatings and paints, thinners, paint removers Ink and toners Textile dyes, finishing and impregnating products General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment Manufacture of furniture Building and construction work Use at industrial sites (IS)
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC7, PROC8a, PROC8b, PROC10, PROC11, PROC19, PROC21, PROC24)

Industrial spraying. Transfer of substance or mixture (charging and discharging) at non-dedicated facilities. Transfer of substance or mixture (charging and discharging) at dedicated facilities. Roller application or brushing. Non industrial spraying. Manual activities involving hand contact. Low energy manipulation and handling of substances bound in/on materials or articles. High (mechanical) energy work-up of substances bound in /on materials and/or articles

Coatings and paints, thinners, paint removers. Textile dyes, finishing and impregnating products. Ink and Toners

PROC7	Industrial spraying
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC10	Roller application or brushing
PROC11	Non industrial spraying
PROC19	Manual activities involving hand contact
PROC21	Low energy manipulation and handling of substances bound in/on materials or articles
PROC24	High (mechanical) energy work-up of substances bound in /on materials and/or articles

Product characteristics

Physical form	Liquid, Aqueous solution
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)

Operational conditions

Other given operational conditions affecting workers exposure	Provide adequate ventilation	
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Conditions and measures related to personal protection, hygiene and health evaluation	Assumes a good basic standard of occupational hygiene is implemented.	
	Wear protective gloves/protective clothing and eye/face protection.	
	Wear suitable respiratory protection,Effective dust mask	
	In case of insufficient ventilation, wear suitable respiratory equipment,(Dust/Mist),At high concentrations:Use self-contained breathing apparatus	
	For further specification, refer to section 8 of the SDS.	

2.2 Contributing scenario controlling environmental exposure (ERC5, ERC8c, ERC8f, ERC10a, ERC10b, ERC11a, ERC11b)

Industrial spraying. Transfer of substance or mixture (charging and discharging) at non-dedicated facilities. Transfer of substance or mixture (charging and discharging) at dedicated facilities. Roller application or brushing. Non industrial spraying. Manual activities involving hand contact. Low energy manipulation and handling of substances bound in/on materials or articles. High (mechanical) energy work-up of substances bound in /on materials and/or articles

Coatings and paints, thinners, paint removers. Textile dyes, finishing and impregnating products. Ink and Toners

ERC5	Use at industrial site leading to inclusion into/onto article
ERC8c	Widespread use leading to inclusion into/onto article (indoor)
ERC8f	Widespread use leading to inclusion into/onto article (outdoor)
ERC10a	Widespread use of articles with low release (outdoor)
ERC10b	Widespread use of articles with high or intended release (outdoor)
ERC11a	Widespread use of articles with low release (indoor)
ERC11b	Widespread use of articles with high or intended release (indoor)

Product characteristics

No additional information

Operational conditions

Amount used	Amounts used	300 t/yr
Frequency and duration of use	Continuous use/release.	365 days/year
Other given operational conditions affecting environmental exposure	Fraction of EU tonnage used in region:	40 t/yr
	Release fraction to wastewater from wide dispersive use:	2,2 kg/day Regional information
	Release fraction to wastewater from wide dispersive use:	14,3 kg/day Europe

Risk management measures

Conditions and measures related to sewage treatment plant	Municipal sewage treatment plant	Applicable
	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	No data available

3.2. Environment

Information for contributing exposure scenario	
2.2	No data available

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

4.1. Health

Guidance - Health	No data available

4.2. Environment

Guidance - Environment	Predicted exposures are not expected to exceed the PNECs when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

1. Exposure scenario 11b

Uses in coatings, Paints

ES Ref.: 11b ES Type: Worker Version: 1	

Use descriptors	PROC7, PROC8a, PROC8b, PROC10, PROC11, PROC19, PROC21, PROC24 PC9a, PC9b, PC18, PC34 AC4, AC11 SU17, SU18, SU19 ERC5, ERC8c, ERC8f, ERC10a, ERC10b, ERC11a, ERC11b
Processes, tasks activities covered	Coatings and paints, thinners, paint removers Ink and toners Textile dyes, finishing and impregnating products General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment Manufacture of furniture Building and construction work Formulation [mixing] of preparations and/or re-packaging (excluding alloys) Widespread use by professional workers (PW)
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC7, PROC8a, PROC8b, PROC10, PROC11, PROC19, PROC21, PROC24)

Industrial spraying. Transfer of substance or mixture (charging and discharging) at non-dedicated facilities. Transfer of substance or mixture (charging and discharging) at dedicated facilities. Roller application or brushing. Non industrial spraying. Manual activities involving hand contact. Low energy manipulation and handling of substances bound in/on materials or articles. High (mechanical) energy work-up of substances bound in /on materials and/or articles

Coatings and paints, thinners, paint removers. Textile dyes, finishing and impregnating products. Ink and Toners

PROC7	Industrial spraying
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC10	Roller application or brushing
PROC11	Non industrial spraying
PROC19	Manual activities involving hand contact
PROC21	Low energy manipulation and handling of substances bound in/on materials or articles
PROC24	High (mechanical) energy work-up of substances bound in /on materials and/or articles

Product characteristics

Physical form	Liquid, Granular solid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)

Operational conditions

Other given operational conditions affecting workers exposure	Liquids	Control of pH value.
	Granular solid	On application, the product does not form dust.

Risk management measures

Technical conditions and measures at process level to prevent release	Not applicable	
Conditions and measures related to personal protection, hygiene and health evaluation	For further specification, refer to section 8 of the SDS.	

2.2 Contributing scenario controlling environmental exposure (ERC5, ERC8c, ERC8f, ERC10a, ERC10b, ERC11a, ERC11b)

Industrial spraying. Transfer of substance or mixture (charging and discharging) at non-dedicated facilities. Transfer of substance or mixture (charging and discharging) at dedicated facilities. Roller application or brushing. Non industrial spraying. Manual activities involving hand contact. Low energy manipulation and handling of substances bound in/on materials or articles. High (mechanical) energy work-up of substances bound in /on materials and/or articles

Coatings and paints, thinners, paint removers. Textile dyes, finishing and impregnating products. Ink and Toners	
ERC5	Use at industrial site leading to inclusion into/onto article
ERC8c	Widespread use leading to inclusion into/onto article (indoor)
ERC8f	Widespread use leading to inclusion into/onto article (outdoor)
ERC10a	Widespread use of articles with low release (outdoor)
ERC10b	Widespread use of articles with high or intended release (outdoor)
ERC11a	Widespread use of articles with low release (indoor)
ERC11b	Widespread use of articles with high or intended release (indoor)

Product characteristics

No additional information

Operational conditions

Amount used	Amounts used	300 t/yr
Frequency and duration of use	Continuous use/release.	365 days/year
Other given operational conditions affecting environmental exposure	Not applicable	

Risk management measures

Conditions and measures related to sewage treatment plant	Municipal sewage treatment plant	Not applicable

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	No data available

3.2. Environment

Information for contributing exposure scenario	
2.2	No data available

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

4.1. Health

Guidance - Health	No data available

4.2. Environment

Guidance - Environment	Predicted exposures are not expected to exceed the PNECs when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

1. Exposure scenario 11c

Uses in coatings, Paints

ES Ref.: 11c ES Type: Consumer Version: 1	

Use descriptors	PC9a, PC18, PC34 AC4, AC11 SU17, SU18, SU19, SU21 ERC8c, ERC8f, ERC10a, ERC10b, ERC11a, ERC11b
Processes, tasks activities covered	Formulation [mixing] of preparations and/or re-packaging (excluding alloys) General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment Manufacture of furniture Building and construction work Consumer use (C)
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario consumer end-use (PC9a, PC18, PC34)

Coatings and paints, thinners, paint removers, Ink and Toners, Textile dyes, finishing and impregnating products; including bleaches and other processing aids	
PC9a	Coatings and paints, thinners, paint removers
PC18	Ink and Toners
PC34	Textile dyes, finishing and impregnating products; including bleaches and other processing aids

Product characteristics

Physical form	Granular solid, Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)

Operational conditions

Other given operational conditions affecting consumers exposure	Indoor and outdoor use.	
	Liquids	Control of pH value.
	Granular solid	On application, the product does not form dust.

Risk management measures

Conditions and measures related to information and behavioural advice to consumers	Not applicable	

2.2 Contributing scenario controlling environmental exposure (ERC8c, ERC8f, ERC10a, ERC10b, ERC11a, ERC11b)

Coatings and paints, thinners, paint removers, Ink and Toners, Textile dyes, finishing and impregnating products; including bleaches and other processing aids	
ERC8c	Widespread use leading to inclusion into/onto article (indoor)
ERC8f	Widespread use leading to inclusion into/onto article (outdoor)
ERC10a	Widespread use of articles with low release (outdoor)
ERC10b	Widespread use of articles with high or intended release (outdoor)
ERC11a	Widespread use of articles with low release (indoor)
ERC11b	Widespread use of articles with high or intended release (indoor)

Product characteristics

No additional information

Operational conditions

Amount used	Annual site tonnage (tons/year):	300
Frequency and duration of use	Continuous use/release.	365 days/year
Environmental factors not influenced by risk management	Release to waste water from process	1 % (300 tons/year)

	Local,Release to waste water from process	0,82 kg/day

Risk management measures

No additional information

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	No data available

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES

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

4.1. Health

Guidance - Health	No data available

4.2. Environment

Guidance - Environment	Predicted exposures are not expected to exceed the PNECs when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

1. Exposure scenario 12a

Photographic activities

ES Ref.: 12a ES Type: Worker Version: 1	

Use descriptors	PROC5, PROC9, PROC13 PC30 SU20 ERC8a
Processes, tasks activities covered	Health services Photochemicals Widespread use by professional workers (PW)
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC5, PROC9, PROC13)

Mixing or blending in batch processes. Transfer of substance or mixture into small containers (dedicated filling line, including weighing). Treatment of articles by dipping and pouring

Photochemicals

PROC5	Mixing or blending in batch processes
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC13	Treatment of articles by dipping and pouring

Product characteristics

Physical form	Liquid, Granular solid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 1 %, Unless otherwise stated

Operational conditions

Other given operational conditions affecting workers exposure	Liquids	Control of pH value.
	Granular solid	On application, the product does not form dust.

Risk management measures

Technical conditions and measures at process level to prevent release	Not applicable	
Conditions and measures related to personal protection, hygiene and health evaluation	For further specification, refer to section 8 of the SDS.	

2.2 Contributing scenario controlling environmental exposure (ERC8a)

Mixing or blending in batch processes. Transfer of substance or mixture into small containers (dedicated filling line, including weighing). Treatment of articles by dipping and pouring

Photochemicals

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

Product characteristics

No additional information

Operational conditions

Amount used	Amounts used	200 t/yr
Other given operational conditions affecting environmental exposure	Not applicable	

Risk management measures

Conditions and measures related to sewage treatment plant	Municipal sewage treatment plant	Not applicable

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	No data available

3.2. Environment

Information for contributing exposure scenario	
2.2	No data available

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

4.1. Health

Guidance - Health	No data available

4.2. Environment

Guidance - Environment	Predicted exposures are not expected to exceed the PNECs when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

1. Exposure scenario 12b

Photographic activities

ES Ref.: 12b ES Type: Consumer Version: 1	

Use descriptors	PC30 SU20 ERC8a
Processes, tasks activities covered	Photochemicals Health services Consumer use (C)
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario consumer end-use (PC30)

PC30	Photo-chemicals

Product characteristics

Physical form	Granular solid, Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)

Operational conditions

Other given operational conditions affecting consumers exposure	Indoor use.	
	Liquids	Control of pH value.
	Granular solid	On application, the product does not form dust.

Risk management measures

Conditions and measures related to information and behavioural advice to consumers	Not applicable	

2.2 Contributing scenario controlling environmental exposure (ERC8a)

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

Product characteristics

No additional information

Operational conditions

Amount used	Annual site tonnage (tons/year):	200

Risk management measures

No additional information

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	No data available

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES

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

4.1. Health

Guidance - Health	No data available

4.2. Environment

Guidance - Environment	Predicted exposures are not expected to exceed the PNECs when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

1. Exposure scenario 13

Use as laboratory reagent

ES Ref.: 13 ES Type: Worker Version: 1	

Use descriptors	PROC1, PROC2, PROC4, PROC8a PC4, PC16, PC20, PC37 SU3 ERC4, ERC7, ERC8f
Processes, tasks activities covered	Anti-Freeze and De-icing products Heat Transfer Fluids Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents Water treatment chemicals Use at industrial sites (IS)
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC4, PROC8a)

Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions. Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions. Chemical production where opportunity for exposure arises. Transfer of substance or mixture (charging and discharging) at non-dedicated facilities

Anti-Freeze and De-icing products. Heat Transfer Fluids. Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents. Water treatment chemicals

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC4	Chemical production where opportunity for exposure arises
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities

Product characteristics

Physical form	Liquid, Aqueous solution
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 1 %, Unless otherwise stated

Operational conditions

Other given operational conditions affecting workers exposure	Provide adequate ventilation	
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Conditions and measures related to personal protection, hygiene and health evaluation	Assumes a good basic standard of occupational hygiene is implemented.	
	Wear protective gloves/protective clothing and eye/face protection.	
	Wear suitable respiratory protection,Effective dust mask	
	In case of insufficient ventilation, wear suitable respiratory equipment,(Dust/Mist),At high concentrations:Use self-contained breathing apparatus	
	For further specification, refer to section 8 of the SDS.	

2.2 Contributing scenario controlling environmental exposure (ERC4, ERC7, ERC8f)

Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions. Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions. Chemical production where opportunity for exposure arises. Transfer of substance or mixture (charging and discharging) at non-dedicated facilities

Anti-Freeze and De-icing products. Heat Transfer Fluids. Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents. Water treatment chemicals	
ERC4	Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ERC7	Use of functional fluid at industrial site
ERC8f	Widespread use leading to inclusion into/onto article (outdoor)

Product characteristics

No additional information

Operational conditions

Amount used	Amounts used	1000 t/yr
Other given operational conditions affecting environmental exposure	Not applicable	

Risk management measures

Conditions and measures related to sewage treatment plant	Municipal sewage treatment plant	Applicable
	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	No data available

3.2. Environment

Information for contributing exposure scenario	
2.2	No data available

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

4.1. Health

Guidance - Health	No data available

4.2. Environment

Guidance - Environment	Predicted exposures are not expected to exceed the PNECs when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

1. Exposure scenario 14

Use in water treatment agents

ES Ref.: 14 ES Type: Worker Version: 1	

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC17, PROC18, PROC20, PROC23 PC4, PC7, PC14, PC16, PC17, PC20, PC25, PC31, PC35, PC37 SU14, SU15, SU16, SU17 ERC4, ERC6b, ERC7
Processes, tasks activities covered	Manufacture of basic metals, including alloys Manufacture of fabricated metal products, except machinery and equipment Manufacture of computer, electronic and optical products, electrical equipment General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment Anti-Freeze and De-icing products Base metals and alloys Metal surface treatment products Heat Transfer Fluids Hydraulic Fluids Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents Metal working fluids Polishes and Wax Blends Washing and cleaning products (including solvent based products) Water treatment chemicals Use at industrial sites (IS)
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC17, PROC18, PROC20, PROC23)

Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions. Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions. Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition. Chemical production where opportunity for exposure arises. Industrial spraying. Transfer of substance or mixture (charging and discharging) at non-dedicated facilities. Transfer of substance or mixture (charging and discharging) at dedicated facilities. Transfer of substance or mixture into small containers (dedicated filling line, including weighing). Roller application or brushing. Treatment of articles by dipping and pouring. Lubrication at high energy conditions in metal working operations. General greasing /lubrication at high kinetic energy conditions. Use of functional fluids in small devices. Open processing and transfer operations at substantially elevated temperature

Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents. Use in water treatment agents

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4	Chemical production where opportunity for exposure arises
PROC7	Industrial spraying
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC10	Roller application or brushing
PROC13	Treatment of articles by dipping and pouring
PROC17	Lubrication at high energy conditions in metal working operations
PROC18	General greasing /lubrication at high kinetic energy conditions
PROC20	Use of functional fluids in small devices
PROC23	Open processing and transfer operations at substantially elevated temperature

Product characteristics

Physical form	Liquid, Aqueous solution
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)

Operational conditions

Other given operational conditions affecting workers exposure	Provide adequate ventilation	
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Conditions and measures related to personal protection, hygiene and health evaluation	Assumes a good basic standard of occupational hygiene is implemented.	
	Wear protective gloves/protective clothing and eye/face protection.	
	Wear suitable respiratory protection,Effective dust mask	
	In case of insufficient ventilation, wear suitable respiratory equipment,(Dust/Mist),At high concentrations:Use self-contained breathing apparatus	
	For further specification, refer to section 8 of the SDS.	

2.2 Contributing scenario controlling environmental exposure (ERC4, ERC6b, ERC7)

Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions. Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions. Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition. Chemical production where opportunity for exposure arises. Industrial spraying. Transfer of substance or mixture (charging and discharging) at non-dedicated facilities. Transfer of substance or mixture (charging and discharging) at dedicated facilities. Transfer of substance or mixture into small containers (dedicated filling line, including weighing). Roller application or brushing. Treatment of articles by dipping and pouring. Lubrication at high energy conditions in metal working operations. General greasing /lubrication at high kinetic energy conditions. Use of functional fluids in small devices. Open processing and transfer operations at substantially elevated temperature

Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents. Use in water treatment agents

ERC4	Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ERC6b	Use of reactive processing aid at industrial site (no inclusion into or onto article)
ERC7	Use of functional fluid at industrial site

Product characteristics

No additional information

Operational conditions

Amount used	Amounts used	1000 t/yr
Other given operational conditions affecting environmental exposure	Release fraction to wastewater from wide dispersive use:	274 kg/day Regional information
	Release fraction to wastewater from wide dispersive use:	2470 kg/day Europe

Risk management measures

Conditions and measures related to sewage treatment plant	Municipal sewage treatment plant	Applicable
	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	No data available

3.2. Environment

Information for contributing exposure scenario

2.2	No data available

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

4.1. Health

Guidance - Health	No data available

4.2. Environment

Guidance - Environment	Predicted exposures are not expected to exceed the PNECs when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

1. Exposure scenario 15

Metal surface treatment products

ES Ref.: 15 ES Type: Worker Version: 1	

Use descriptors	PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC17, PROC18, PROC23 PC7, PC14, PC25, PC31, PC35 SU14, SU15, SU16, SU17 ERC4, ERC6b
Processes, tasks activities covered	Manufacture of basic metals, including alloys Manufacture of fabricated metal products, except machinery and equipment Manufacture of computer, electronic and optical products, electrical equipment General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment Base metals and alloys Metal surface treatment products Metal working fluids Polishes and Wax Blends Washing and cleaning products (including solvent based products) Use at industrial sites (IS)
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC17, PROC18, PROC23)

Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition. Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions. Chemical production where opportunity for exposure arises. Industrial spraying. Transfer of substance or mixture (charging and discharging) at dedicated facilities. Transfer of substance or mixture (charging and discharging) at non-dedicated facilities. Transfer of substance or mixture into small containers (dedicated filling line, including weighing). Roller application or brushing. Treatment of articles by dipping and pouring. Lubrication at high energy conditions in metal working operations. General greasing /lubrication at high kinetic energy conditions. Open processing and transfer operations at substantially elevated temperature

Base metals and alloys. Metal surface treatment products. Metal working fluids. Polishes and wax blends. Washing and cleaning products (including solvent based products)

PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4	Chemical production where opportunity for exposure arises
PROC7	Industrial spraying
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC10	Roller application or brushing
PROC13	Treatment of articles by dipping and pouring
PROC17	Lubrication at high energy conditions in metal working operations
PROC18	General greasing /lubrication at high kinetic energy conditions
PROC23	Open processing and transfer operations at substantially elevated temperature

Product characteristics

Physical form	Liquid, Aqueous solution
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)

Operational conditions

Other given operational conditions affecting workers exposure	Provide adequate ventilation	
	Assumes a good basic standard of occupational	

	hygiene is implemented.	

Risk management measures

Conditions and measures related to personal protection, hygiene and health evaluation	Assumes a good basic standard of occupational hygiene is implemented.	
	Wear protective gloves/protective clothing and eye/face protection.	
	Wear suitable respiratory protection,Effective dust mask	
	In case of insufficient ventilation, wear suitable respiratory equipment,(Dust/Mist),At high concentrations:Use self-contained breathing apparatus	
	For further specification, refer to section 8 of the SDS.	

2.2 Contributing scenario controlling environmental exposure (ERC4, ERC6b)

Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition. Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions. Chemical production where opportunity for exposure arises. Industrial spraying. Transfer of substance or mixture (charging and discharging) at dedicated facilities. Transfer of substance or mixture (charging and discharging) at non-dedicated facilities. Transfer of substance or mixture into small containers (dedicated filling line, including weighing). Roller application or brushing. Treatment of articles by dipping and pouring. Lubrication at high energy conditions in metal working operations. General greasing /lubrication at high kinetic energy conditions. Open processing and transfer operations at substantially elevated temperature

Base metals and alloys. Metal surface treatment products. Metal working fluids. Polishes and wax blends. Washing and cleaning products (including solvent based products)

ERC4	Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ERC6b	Use of reactive processing aid at industrial site (no inclusion into or onto article)

Product characteristics

No additional information

Operational conditions

Amount used	Amounts used	1000 t/yr
Other given operational conditions affecting environmental exposure	Not applicable	

Risk management measures

Conditions and measures related to sewage treatment plant	Municipal sewage treatment plant	Applicable
	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	No data available

3.2. Environment

Information for contributing exposure scenario	
2.2	No data available

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

4.1. Health

Guidance - Health	No data available

4.2. Environment

Guidance - Environment	Predicted exposures are not expected to exceed the PNECs when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

1. Exposure scenario 16a

agriculture

ES Ref.: 16a ES Type: Worker Version: 1	

Use descriptors	PROC3, PROC5, PROC8a, PROC8b, PROC10, PROC11, PROC14, PROC15, PROC19 PC8, PC12, PC21 SU1 ERC2, ERC4, ERC8b, ERC8d
Processes, tasks activities covered	Agriculture, forestry, fishery Biocidal products Lawn and Garden Preparations, including fertilizers Use at industrial sites (IS)
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC3, PROC5, PROC8a, PROC8b, PROC10, PROC11, PROC14, PROC15, PROC19)

Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition. Mixing or blending in batch processes. Transfer of substance or mixture (charging and discharging) at non-dedicated facilities. Transfer of substance or mixture (charging and discharging) at dedicated facilities. Roller application or brushing. Non industrial spraying. Tabletting, compression, extrusion, pelettisation, granulation. Use as laboratory reagent. Manual activities involving hand contact

Biocidal products (e.g. Disinfectants, pest control). Fertilizers. Lawn and Garden Preparations, including fertilizers

PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC5	Mixing or blending in batch processes
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC10	Roller application or brushing
PROC11	Non industrial spraying
PROC14	Tabletting, compression, extrusion, pelettisation, granulation
PROC15	Use as laboratory reagent
PROC19	Manual activities involving hand contact

Product characteristics

Physical form	Liquid, Aqueous solution
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)

Operational conditions

Other given operational conditions affecting workers exposure	Provide adequate ventilation	
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Conditions and measures related to personal protection, hygiene and health evaluation	Assumes a good basic standard of occupational hygiene is implemented.	
	Wear protective gloves/protective clothing and eye/face protection.	
	Wear suitable respiratory protection,Effective dust mask	
	In case of insufficient ventilation, wear suitable respiratory equipment,(Dust/Mist),At high concentrations:Use self-contained breathing apparatus	
	For further specification, refer to section 8 of the SDS.	

2.2 Contributing scenario controlling environmental exposure (ERC2, ERC4, ERC8b, ERC8d)

Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition. Mixing or blending in batch processes. Transfer of substance or mixture (charging and discharging) at non-dedicated facilities. Transfer of substance or mixture (charging and discharging) at dedicated facilities. Roller application or brushing. Non industrial spraying. Tabletting, compression, extrusion, pelettisation, granulation. Use as laboratory reagent. Manual activities involving hand contact

Biocidal products (e.g. Disinfectants, pest control). Fertilizers. Lawn and Garden Preparations, including fertilizers

ERC2	Formulation into mixture
ERC4	Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ERC8b	Widespread use of reactive processing aid (no inclusion into or onto article, indoor)
ERC8d	Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)

Product characteristics

No additional information

Operational conditions

Amount used	Amounts used	1500 t/yr
Frequency and duration of use	Continuous use/release.	365 days/year
Other given operational conditions affecting environmental exposure	Release fraction to soil from wide dispersive use (regional only):	3699 kg/day
	Release fraction to wastewater from wide dispersive use:	411 kg/day

Risk management measures

Conditions and measures related to sewage treatment plant	Municipal sewage treatment plant	Applicable
	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	No data available

3.2. Environment

Information for contributing exposure scenario	
2.2	No data available

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

4.1. Health

Guidance - Health	No data available

4.2. Environment

Guidance - Environment	Predicted exposures are not expected to exceed the PNECs when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

1. Exposure scenario 16b

agriculture

ES Ref.: 16b ES Type: Worker Version: 1	

Use descriptors	PROC3, PROC5, PROC8a, PROC8b, PROC10, PROC11, PROC14, PROC15, PROC19 PC8, PC12, PC21 SU1 ERC2, ERC4, ERC8b, ERC8d
Processes, tasks activities covered	Agriculture, forestry, fishery Biocidal products Lawn and Garden Preparations, including fertilizers Use at industrial sites (IS)
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC3, PROC5, PROC8a, PROC8b, PROC10, PROC11, PROC14, PROC15, PROC19)

Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition. Mixing or blending in batch processes. Transfer of substance or mixture (charging and discharging) at non-dedicated facilities. Transfer of substance or mixture (charging and discharging) at dedicated facilities. Roller application or brushing. Non industrial spraying. Tabletting, compression, extrusion, pelettisation, granulation. Use as laboratory reagent. Manual activities involving hand contact

Biocidal products (e.g. Disinfectants, pest control). Fertilizers. Lawn and Garden Preparations, including fertilizers

PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC5	Mixing or blending in batch processes
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC10	Roller application or brushing
PROC11	Non industrial spraying
PROC14	Tabletting, compression, extrusion, pelettisation, granulation
PROC15	Use as laboratory reagent
PROC19	Manual activities involving hand contact

Product characteristics

Physical form	Liquid, Granular solid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)

Operational conditions

Other given operational conditions affecting workers exposure	Liquids	Control of pH value.
	Granular solid	On application, the product does not form dust.

Risk management measures

Technical conditions and measures at process level to prevent release	Not applicable	
Conditions and measures related to personal protection, hygiene and health evaluation	For further specification, refer to section 8 of the SDS.	

2.2 Contributing scenario controlling environmental exposure (ERC2, ERC4, ERC8b, ERC8d)

Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition. Mixing or blending in batch processes. Transfer of substance or mixture (charging and discharging) at non-dedicated facilities. Transfer of substance or mixture (charging and discharging) at dedicated facilities. Roller application or brushing. Non industrial spraying. Tabletting, compression, extrusion, pelettisation, granulation. Use as laboratory reagent. Manual activities involving hand contact

Biocidal products (e.g. Disinfectants, pest control). Fertilizers. Lawn and Garden Preparations, including fertilizers

ERC2	Formulation into mixture
ERC4	Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ERC8b	Widespread use of reactive processing aid (no inclusion into or onto article, indoor)
ERC8d	Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)

Product characteristics

No additional information

Operational conditions

Amount used	Amounts used	1500 t/yr
Frequency and duration of use	Continuous use/release.	365 days/year
Other given operational conditions affecting environmental exposure	Not applicable	

Risk management measures

Conditions and measures related to sewage treatment plant	Municipal sewage treatment plant	Not applicable

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	No data available

3.2. Environment

Information for contributing exposure scenario	
2.2	No data available

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

4.1. Health

Guidance - Health	No data available

4.2. Environment

Guidance - Environment	Predicted exposures are not expected to exceed the PNECs when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

1. Exposure scenario 16c

agriculture

ES Ref.: 16c ES Type: Consumer Version: 1	

Use descriptors	PC8, PC12, PC21 SU1 ERC8b, ERC8d
Processes, tasks activities covered	Agriculture, forestry, fishery Biocidal products Fertilizers Lawn and Garden Preparations, including fertilizers Consumer use (C)
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario consumer end-use (PC8, PC12, PC21)

Biocidal products (e.g. Disinfectants, pest control), Fertilizers, Lawn and Garden Preparations, including fertilizers	
PC8	Biocidal products
PC12	Fertilizers
PC21	Laboratory chemicals

Product characteristics

Physical form	Granular solid, Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)

Operational conditions

Other given operational conditions affecting consumers exposure	Liquids	Control of pH value.
	Granular solid	On application, the product does not form dust.

Risk management measures

Conditions and measures related to information and behavioural advice to consumers	Not applicable	

2.2 Contributing scenario controlling environmental exposure (ERC8b, ERC8d)

Biocidal products (e.g. Disinfectants, pest control), Fertilizers, Lawn and Garden Preparations, including fertilizers	
ERC8b	Widespread use of reactive processing aid (no inclusion into or onto article, indoor)
ERC8d	Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)

Product characteristics

No additional information

Operational conditions

Amount used	Annual site tonnage (tons/year):	1500
Frequency and duration of use	Continuous use/release.	365 days/year

Risk management measures

No additional information

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	No data available

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES

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

4.1. Health

Guidance - Health	No data available

4.2. Environment

Guidance - Environment	Predicted exposures are not expected to exceed the PNECs when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

1. Exposure scenario 17a

Medical devices

ES Ref.: 17a ES Type: Worker Version: 1	

Use descriptors	PROC1 PC20 SU20 ERC7
Processes, tasks activities covered	Health services Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents Use at industrial sites (IS)
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1)

Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents	
PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Product characteristics

Physical form	Liquid, Aqueous solution
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)

Operational conditions

Other given operational conditions affecting workers exposure	Provide adequate ventilation	
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Conditions and measures related to personal protection, hygiene and health evaluation	Assumes a good basic standard of occupational hygiene is implemented.	
	Wear protective gloves/protective clothing and eye/face protection.	
	Wear suitable respiratory protection,Effective dust mask	
	In case of insufficient ventilation, wear suitable respiratory equipment,(Dust/Mist),At high concentrations:Use self-contained breathing apparatus	
	For further specification, refer to section 8 of the SDS.	

2.2 Contributing scenario controlling environmental exposure (ERC7)

Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents	
ERC7	Use of functional fluid at industrial site

Product characteristics

No additional information

Operational conditions

Amount used	Amounts used	1000 t/yr
Frequency and duration of use	Continuous use/release.	365 days/year
Other given operational conditions affecting	Not applicable	

environmental exposure		

Risk management measures

Conditions and measures related to sewage treatment plant	Municipal sewage treatment plant	Applicable
	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	No data available

3.2. Environment

Information for contributing exposure scenario	
2.2	No data available

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

4.1. Health

Guidance - Health	No data available

4.2. Environment

Guidance - Environment	Predicted exposures are not expected to exceed the PNECs when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

1. Exposure scenario 17b

Medical devices

ES Ref.: 17b ES Type: Worker Version: 1	

Use descriptors	PROC1 PC20 SU22 ERC7
Processes, tasks activities covered	Health services Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents Use at industrial sites (IS)
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1)

Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents	
PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Product characteristics

Physical form	Liquid, Granular solid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)

Operational conditions

Other given operational conditions affecting workers exposure	Liquids	Control of pH value.
	Granular solid	On application, the product does not form dust.

Risk management measures

Technical conditions and measures at process level to prevent release	Not applicable	
Conditions and measures related to personal protection, hygiene and health evaluation	For further specification, refer to section 8 of the SDS.	

2.2 Contributing scenario controlling environmental exposure (ERC7)

Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents	
ERC7	Use of functional fluid at industrial site

Product characteristics

No additional information

Operational conditions

Amount used	Amounts used	1000 t/yr
Other given operational conditions affecting environmental exposure	Not applicable	

Risk management measures

Conditions and measures related to sewage treatment plant	Municipal sewage treatment plant	Not applicable

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	No data available

3.2. Environment

Information for contributing exposure scenario	
2.2	No data available

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

4.1. Health

Guidance - Health	No data available

4.2. Environment

Guidance - Environment	Predicted exposures are not expected to exceed the PNECs when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

1. Exposure scenario 17c

Medical devices

ES Ref.: 17c ES Type: Consumer Version: 1	

Use descriptors	PC20 SU21 ERC7
Processes, tasks activities covered	Health services Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents Consumer use (C)
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario consumer end-use (PC20)

Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents	
PC20	Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents

Product characteristics

Physical form	Granular solid, Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)

Operational conditions

Other given operational conditions affecting consumers exposure	Liquids	Control of pH value.
	Granular solid	On application, the product does not form dust.

Risk management measures

Conditions and measures related to information and behavioural advice to consumers	Not applicable	

2.2 Contributing scenario controlling environmental exposure (ERC7)

Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents	
ERC7	Use of functional fluid at industrial site

Product characteristics

No additional information

Operational conditions

Amount used	Annual site tonnage (tons/year):	1000

Risk management measures

No additional information

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	No data available

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES

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

4.1. Health

Guidance - Health	No data available

4.2. Environment

Guidance - Environment	Predicted exposures are not expected to exceed the PNECs when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.