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

1.1. Product identifier

Trade name
EXOLIT RP 607

Material number: 193051

REACH - Registration number according to article 20(3): 01-2119489913-23-0000, 01-2119555669-21-0043, 01-2119560591-39

Chemical nature: Red phosphorus, stabilized and microencapsulated

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

Relevant identified uses of the substance or mixture

Industry sector : Plastic processing industry.
Type of use : Flame retardants

Uses advised against

Type of use : Industrial manufacture of screening smoke ammunition or smoke payloads.
Screening smoke ammunition and smoke payloads are produced by mixing red phosphorus with oxidizing substances which will lead to an explosive mixture. The safe use of explosive mixtures cannot be described in an exposure assessment according to Regulation (EC) No. 1907/2006. Thus this use is not supported.

Exposure scenarios: see annex

1.3. Details of the supplier of the safety data sheet

Identification of the company

Clariant Plastics & Coatings (Deutschland) GmbH
65926 Frankfurt am Main
Telephone no. : +49 69 305 18000

Information about the substance/mixture

BU Additives
Product Stewardship
e-mail: SDS.Europe@clariant.com

1.4. Emergency telephone number

00800-5121 5121 (24 h)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Flammable solids, Category 1	H228: Flammable solid.
Skin sensitisation, Category 1	H317: May cause an allergic skin reaction.
Long-term (chronic) aquatic hazard,	H412: Harmful to aquatic life with long lasting

Category 3	effects.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms :

Signal word : Danger

Hazard statements :
H228 Flammable solid.
H317 May cause an allergic skin reaction.
H412 Harmful to aquatic life with long lasting effects.

Precautionary statements :

Prevention:

P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical equipment.
P273 Avoid release to the environment.

Response:

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.

2.3 Other hazards

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

SECTION 3: Composition/information on ingredients

3.1 Substances

Substance name : Red phosphorus, stabilized and microencapsulated

Components

Chemical name	CAS-No. EC-No.	Concentration (% w/w)
Red phosphorus stabilized with tin sulfate	Not Assigned	>= 90 - <= 100
Tin sulphate	7488-55-3 231-302-2	>= 2,5 - < 3
Aliphatic polyamine	Not Assigned	>= 1 - < 2,5

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice : Remove/Take off immediately all contaminated clothing.
Get medical attention.

If inhaled : Get medical attention if symptoms occur.

In case of skin contact : IF ON SKIN: Wash with plenty of soap and water.
In case of skin burns caused by contact with phosphorus, immediately physically remove any phosphorus adhering to the skin with water (e.g. by using a brush) and douse with a 2% copper sulphate solution.
Cover wounds with a sterile dressing, and keep moist in all circumstances.
Immediate medical treatment necessary, as untreated burns can result in slow-healing wounds and toxication with phosphorus yellow.

In case of eye contact : In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

If swallowed : If swallowed do not induce vomiting,seek medical advice and show safety datasheet or label

4.2 Most important symptoms and effects, both acute and delayed

Symptoms : Allergic reactions

Risks : May cause an allergic skin reaction.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment : After a burn to the skin caused by phosphorus, any residual product adhering to the wound must be removed mechanically with a brush in order to prevent further burns or toxic effects through dermal absorption of yellow phosphorus. The wound must then be rinsed immediately with a commercial solution of 2% copper sulphate in order to neutralise any residual yellow phosphorous. Any such wound must be kept damp in all circumstances during movement of the victim for further medical treatment, so that any residual yellow phosphorus does not lead to further inflammation.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Water (with detergent)
Water spray jet
Water mist
Sand
Foam

Unsuitable extinguishing media	:	gaseous extinguishing media Carbon dioxide (CO2)

5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting	:	In case of fire hazardous decomposition products may be produced such as: Phosphorus oxides (eg Phosphorus pentoxide) Phosphorus pentoxide in air forms a dense, non-transparent, corrosive mist of phosphoric acid.

5.3 Advice for firefighters

Special protective equipment for firefighters	:	Self-contained breathing apparatus In case of fire, use acid-resistant equipment / personal protective equipment.
Further information	:	If the product is involved in a fire, yellow/white phosphorus can be formed, which may cause re-ignition of areas already extinguished. Following a fire, residual matter must be kept under water, or kept damp, in order to avoid the possibly that adhering residual yellow phosphorus spontaneously re-ignites.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions	:	See: Exposure controls and personal protection.

6.2 Environmental precautions

Environmental precautions	:	The product should not be allowed to enter drains, water courses or the soil. Collect contaminated fire extinguishing water separately. This must not be discharged into drains.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up	:	Dampen dust and place it in a properly closed receptacle and dispose of it safely. Do not allow to dry. Avoid dust formation. Carefully oxidise small amounts (e.g. with diluted bleaching powder solution, hydrogen peroxide solution)

6.4 Reference to other sections

Information regarding Safe handling, see chapter 7.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling	:	Handle under nitrogen, protect from moisture. Avoid dust formation. Avoid shock and friction. Take measures to prevent the build up of electrostatic charge. Risk of ignition. All metal parts of the mixing and processing equipment must be earthed. Use antistatic tools. Keep working area moist and well ventilated. Ensure that dried product residues are re-dampened before transferring, handling or transporting.
Advice on protection against fire and explosion	:	Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge. Render equipment and apparatus inert (nitrogen, inert gases) and earth before putting into operation Avoid impact, friction and accumulation of electrostatic charge Use only non-sparking tools. Avoid dust formation. Always keep working area moist and well-ventilated Cover extinguished areas with 10% copper sulphate or sode solution. Detergents may be added to the solutions
Hygiene measures	:	Clean skin thoroughly after work; apply skin cream.
Temperature class	:	T5
Fire-fighting class	:	A
Dust explosion class	:	ST3 Capable of dust explosion

7.2 Conditions for safe storage, including any incompatibilities

Further information on storage conditions	:	Keep container tightly closed. Store contents under nitrogen.
Advice on common storage	:	Do not store with strong oxidizing agents
Further information on storage stability	:	When stored in unopened container, the product is stable for at least 12 month.

7.3 Specific end use(s)

Specific use(s)	:	No further recommendations.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

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

Substance name	End Use	Exposure routes	Potential health effects	Value

Red phosphorus CAS-No.: 7723-14-0	Workers	Dermal	Long-term systemic effects	30 mg/kg bw/day
Remarks:	DNEL			
	Workers	Inhalation	Long-term systemic effects	4 mg/m3
Remarks:	DNEL			
Tin sulphate CAS-No.: 7488-55-3	Workers	Inhalation	Long-term systemic effects	1,375 mg/m3
Remarks:	DNEL			
	Workers	Inhalation	Acute systemic effects	2,75 mg/m3
Remarks:	DNEL			
	Workers	Inhalation	Long-term local effects	14,51 mg/m3
Remarks:	DNEL			
	Workers	Inhalation	Acute local effects	14,51 mg/m3
Remarks:	DNEL			
	Workers	Skin contact	Long-term systemic effects	0,39 mg/kg bw/day
Remarks:	DNEL			
	Workers	Skin contact	Acute systemic effects	0,78 mg/kg bw/day
Remarks:	DNEL			
	General population	Inhalation	Long-term systemic effects	0,289 mg/m3
Remarks:	DNEL			
	General population	Inhalation	Acute systemic effects	0,57 mg/m3
Remarks:	DNEL			
	General population	Inhalation	Long-term local effects	3,05 mg/m3
Remarks:	DNEL			
	General population	Inhalation	Acute local effects	3,05 mg/m3
Remarks:	DNEL			
	General population	Skin contact	Long-term systemic effects	0,195 mg/kg bw/day
Remarks:	DNEL			
	General population	Skin contact	Acute systemic effects	0,39 mg/kg bw/day
Remarks:	DNEL			
	General population	Ingestion	Long-term systemic effects	0,195 mg/kg bw/day
Remarks:	DNEL			
	General population	Ingestion	Acute systemic effects	0,39 mg/kg bw/day
Remarks:	DNEL			

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

Substance name	Environmental Compartment	Value
Red phosphorus CAS-No.: 7723-14-0	Fresh water	0,00105 mg/l

	Water (intermittent release)	0,0105 mg/l
	Sewage treatment plant	10 mg/l
	Fresh water sediment	100 mg/kg dry weight (d.w.)
	Soil	12,5 mg/kg dry weight (d.w.)
Tin sulphate CAS-No.: 7488-55-3	Fresh water	0,9 mg/l
	Water (intermittent release)	5 µg/l
	Sewage treatment plant	12 mg/l
	Fresh water sediment	58 mg/kg dry weight (d.w.)

8.2 Exposure controls

Personal protective equipment

Eye protection : safety glasses/face shield

Hand protection
Remarks : Nitrile rubber gloves. Minimum breakthrough time (glove): not determined Minimum thickness (glove): not determined Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact).

Skin and body protection : Antistatic boots
Flame-resistant clothing

Respiratory protection : Half mask with a particle filter P2 (EN 143)

Protective measures : Avoid prolonged or repeated contact with skin.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance : powder

Colour : red brown

Odour : odourless

pH : approx. 7 (20 °C)
Concentration: 100 g/l
Suspension in water

Melting point (decomposition) : 600 °C
(42.000 hPa)

Boiling point : Study not performed as melting point is above 300 °C (REACH exemption Annex VII).

Flash point : Not applicable

Burning rate	:	3,3 - 5,6 mm/s Method: 92/69/EG (L383) A.10 * Entzünd GLP: no
Burning number	:	5 Method: VDI 2263, ESCIS, Vol. 1 Complete combustion with flames
Upper explosion limit / upper flammability limit	:	Not applicable
Lower explosion limit / Lower flammability limit	:	Not applicable
Vapour pressure	:	100 hPa (300 °C) 1.000 hPa (400 °C)
Relative density	:	2,2 (20 °C)
Density	:	approx. 2,2 g/cm3
Bulk density	:	700 - 1.200 kg/m3 (20 °C)
Solubility(ies)		
Water solubility	:	insoluble
Solubility in other solvents	:	Description: Insoluble in most organic solvents.
Partition coefficient: n-octanol/water	:	Not applicable
Auto-ignition temperature	:	> 340 °C Method: VDI 2263 "Dust fires and explosions; Danger, Evaluation, Protection measures"
Decomposition temperature	:	> 400 °C Heating rate: 1 K/min Method: DTA
Viscosity		
Viscosity, dynamic	:	Not applicable
Explosive properties	:	Not explosive Not explosive Method: Expert judgement
Oxidizing properties	:	The product does not contain organic peroxide-groups which result from either the manufacturing process or from added ingredients.

9.2 Other information

Impact sensitivity	:	Impact sensitive.

Surface tension	:	not required
Sublimation point	:	Not applicable
Dust explosion class	:	ST3 Capable of dust explosion
Minimum ignition energy	:	approx. 0,1 mJ
Particle size	:	< 400 µm
Self-ignition	:	300 °C Method: VDI 2263 (Grewer)

SECTION 10: Stability and reactivity

10.1 Reactivity

See section 10.3. "Possibility of hazardous reactions"

10.2 Chemical stability

Stable

10.3 Possibility of hazardous reactions

Hazardous reactions	:	Risk of dust explosion., Explosive reactions with oxidising agents such as potassium chlorate and/or peroxides., At high temperatures small amounts of hydrogen phosphide are formed with water., Not corrosive to metals

10.4 Conditions to avoid

Conditions to avoid	:	sparks Thermal decomposition ignition shock friction

10.5 Incompatible materials

Materials to avoid	:	oxidants

10.6 Hazardous decomposition products

Hydrogen phosphide
White/yellow phosphorus

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Product:

Acute oral toxicity	:	LD50 (Rat, female): > 15.000 mg/kg Method: OECD Test Guideline 401

GLP: no
Remarks: No significant adverse effects were reported

Acute inhalation toxicity : Remarks: no data available

Acute dermal toxicity : Remarks: no data available

Components:

Red phosphorus stabilized with tin sulfate:

Acute oral toxicity : LD50 (Rat, female): > 15.000 mg/kg
Method: OECD Test Guideline 401
GLP: no
Remarks: No significant adverse effects were reported

Acute inhalation toxicity : Remarks: no data available

Acute dermal toxicity : Remarks: no data available

Tin sulphate:

Acute oral toxicity : LD50 (Rat): > 2.000 mg/kg
Method: OECD Test Guideline 401
Test substance: anhydrous substance

Acute inhalation toxicity : Assessment: The component/mixture is moderately toxic after short term inhalation.
Remarks: no data available

Acute dermal toxicity : Remarks: This information is not available.

Skin corrosion/irritation

Product:

Species : Rabbit
Exposure time : 24 h
Method : OECD Test Guideline 404
Result : No skin irritation
GLP : no

Components:

Red phosphorus stabilized with tin sulfate:

Species : Rabbit
Exposure time : 24 h
Method : OECD Test Guideline 404
Result : No skin irritation
GLP : no

Tin sulphate:

Species : Rabbit
Exposure time : < 4 h

Result	:	Irritating to skin.

Serious eye damage/eye irritation

Product:

Species	:	Rabbit
Exposure time	:	24 h
Method	:	OECD Test Guideline 405
Result	:	No eye irritation
GLP	:	no

Components:

Red phosphorus stabilized with tin sulfate:

Species	:	Rabbit
Exposure time	:	24 h
Method	:	OECD Test Guideline 405
Result	:	No eye irritation
GLP	:	no

Tin sulphate:

Species	:	rabbit eye
Result	:	Risk of serious damage to eyes.

Respiratory or skin sensitisation

Product:

Test Type	:	Buehler Test
Exposure routes	:	Dermal
Species	:	Guinea pig
Method	:	OECD Test Guideline 406
Result	:	Not a skin sensitizer.
GLP	:	no

Components:

Red phosphorus stabilized with tin sulfate:

Test Type	:	Buehler Test
Exposure routes	:	Dermal
Species	:	Guinea pig
Method	:	OECD Test Guideline 406
Result	:	Not a skin sensitizer.
GLP	:	no

Tin sulphate:

Test Type	:	Open epicutaneous test
Exposure routes	:	Skin contact
Species	:	Humans
Method	:	tests on human beings
Result	:	May cause sensitisation by skin contact.

GLP : No information available.

Germ cell mutagenicity

Product:

Genotoxicity in vitro : Test Type: Ames test
Test system: Salmonella typhimurium
Concentration: 3 - 5000 mg/plate
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative
GLP: yes

Test Type: In vitro mammalian cell gene mutation test
Test system: Chinese hamster lung cells
Concentration: 1,3 - 60 µg/ml
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative
GLP: yes

Test Type: Chromosome aberration test in vitro
Test system: Chinese hamster lung cells
Concentration: 2,3 - 5000 µg/ml
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative
GLP: yes

Germ cell mutagenicity- Assessment : In vitro tests did not show mutagenic effects

Components:

Red phosphorus stabilized with tin sulfate:

Genotoxicity in vitro : Test Type: Ames test
Test system: Salmonella typhimurium
Concentration: 3 - 5000 mg/plate
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative
GLP: yes

Test Type: In vitro mammalian cell gene mutation test
Test system: Chinese hamster lung cells
Concentration: 1,3 - 60 µg/ml
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative
GLP: yes

Test Type: Chromosome aberration test in vitro

Test system: Chinese hamster lung cells
Concentration: 2,3 - 5000 µg/ml
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative
GLP: yes

Germ cell mutagenicity-Assessment : In vitro tests did not show mutagenic effects

Tin sulphate:

Genotoxicity in vitro : Test Type: In vitro gene mutation study in mammalian cells
Test system: mouse lymphoma cells
Concentration: 10 - 100 µg/ml
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative
Remarks: By analogy with a product of similar composition

Germ cell mutagenicity-Assessment : It is concluded that the product is not mutagenic based on evaluation of several mutagenicity tests.

Carcinogenicity

Product:

Carcinogenicity - Assessment : No information available.

Components:

Red phosphorus stabilized with tin sulfate:

Carcinogenicity - Assessment : No information available.

Tin sulphate:

Carcinogenicity - Assessment : Not classifiable as a human carcinogen.

Reproductive toxicity

Product:

Reproductive toxicity - Assessment : No information available.

Components:

Red phosphorus stabilized with tin sulfate:

Reproductive toxicity - Assessment : No information available.

Tin sulphate:

Effects on fertility	:	Remarks: This information is not available.
Effects on foetal development	:	Remarks: This information is not available.
Reproductive toxicity - Assessment	:	No reproductive toxicity to be expected. No teratogenic effects to be expected.

STOT - single exposure

Product:

Assessment	:	The substance or mixture is not classified as specific target organ toxicant, single exposure.

Components:

Red phosphorus stabilized with tin sulfate:

Assessment	:	The substance or mixture is not classified as specific target organ toxicant, single exposure.

Tin sulphate:

Assessment	:	May cause respiratory irritation.

STOT - repeated exposure

Product:

Assessment	:	The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Components:

Red phosphorus stabilized with tin sulfate:

Assessment	:	The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Tin sulphate:

Exposure routes	:	Oral
Target Organs	:	Cardiovascular
Assessment	:	May cause damage to organs through prolonged or repeated exposure.

Repeated dose toxicity

Product:

Method	:	Repeated dose toxicity
Remarks	:	The study is not necessary from a scientific perspective.

Components:

Red phosphorus stabilized with tin sulfate:

Method	:	Repeated dose toxicity
Remarks	:	The study is not necessary from a scientific perspective.

Tin sulphate:

Remarks	:	This information is not available.

Aspiration toxicity

Product:

no data available

Components:

Red phosphorus stabilized with tin sulfate:

no data available

Tin sulphate:

No aspiration toxicity classification

Experience with human exposure

Product:

General Information	:	Health injuries are not known or expected under normal use.

Components:

Red phosphorus stabilized with tin sulfate:

General Information	:	Health injuries are not known or expected under normal use.

Further information

Product:

Remarks	:	Frequent contact can lead to skin and eye irritation, especially if product is allowed to dry out
Remarks	:	Since 1997 the lung function of about 70 workers has been examined annually and documented, which showed no change of lung function associated with red phosphorus dust.

Components:

Red phosphorus stabilized with tin sulfate:

Remarks	:	Frequent contact can lead to skin and eye irritation, especially if product is allowed to dry out
Remarks	:	Since 1997 the lung function of about 70 workers has been examined annually and documented, which showed no change of lung function associated with red phosphorus dust.

SECTION 12: Ecological information

12.1 Toxicity

Product:

Toxicity to fish	:	LC50 (Danio rerio (zebra fish)): 33,2 mg/l Exposure time: 96 h Test Type: static test Analytical monitoring: no Method: OECD Test Guideline 203 GLP: yes Remarks: The details of the toxic effect relate to the nominal concentration.
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 10,5 mg/l End point: Immobilization Exposure time: 48 h Test Type: static test Analytical monitoring: no Method: OECD Test Guideline 202 GLP: yes Remarks: The details of the toxic effect relate to the nominal concentration.
Toxicity to algae/aquatic plants	:	ErC50 (Desmodesmus subspicatus (green algae)): 18,3 mg/l End point: Growth rate Exposure time: 72 h Test Type: static test Analytical monitoring: yes Method: OECD Test Guideline 201 GLP: yes Remarks: The details of the toxic effect relate to the nominal concentration. NOEC (Desmodesmus subspicatus (green algae)): 5 mg/l End point: Growth rate Exposure time: 72 h Test Type: static test Analytical monitoring: yes Method: OECD Test Guideline 201 GLP: yes Remarks: The details of the toxic effect relate to the nominal concentration. ErC10 (Desmodesmus subspicatus (green algae)): 6,6 mg/l End point: Growth rate Exposure time: 72 h Test Type: static test Analytical monitoring: yes Method: OECD Test Guideline 201 GLP: yes Remarks: The details of the toxic effect relate to the nominal

concentration.

Toxicity to fish (Chronic toxicity)	:	Remarks: no data available
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	Remarks: no data available
Toxicity to microorganisms	:	EC50 (activated sludge): > 1.000 mg/l End point: Bacteria toxicity (respiration inhibition) Exposure time: 3 h Test Type: Respiration inhibition Analytical monitoring: no Method: OECD Test Guideline 209 GLP: yes
	:	NOEC : 1.000 mg/l End point: Nitrate formation rate Exposure time: 28 d Test Type: Other Analytical monitoring: no Method: OECD 216 GLP: yes
Toxicity to soil dwelling organisms	:	Test Type: artificial soil EC50: 428 mg/kg Exposure time: 56 d End point: Reproduction Species: Eisenia fetida (earthworms) Method: OECD Test Guideline 222 GLP:yes Test Type: artificial soil NOEC: 1.000 mg/kg Exposure time: 96 h End point: mortality Species: Nematode Caenorhabditis elegans Method: Other GLP:yes
Sediment toxicity	:	NOEC: 1000 mg/kg Duration: 28 d Sediment: artificial soil Exposure duration: 28 d Species: Lumbriculus variegatus (Worm) Basis for effect: Reproduction Method: OECD 225 GLP: yes

Components:

Red phosphorus stabilized with tin sulfate:

Toxicity to fish : LC50 (Danio rerio (zebra fish)): 33,2 mg/l
Exposure time: 96 h
Test Type: static test
Analytical monitoring: no
Method: OECD Test Guideline 203
GLP: yes
Remarks: The details of the toxic effect relate to the nominal concentration.

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 10,5 mg/l
End point: Immobilization
Exposure time: 48 h
Test Type: static test
Analytical monitoring: no
Method: OECD Test Guideline 202
GLP: yes
Remarks: The details of the toxic effect relate to the nominal concentration.

Toxicity to algae/aquatic plants : ErC50 (Desmodesmus subspicatus (green algae)): 18,3 mg/l
End point: Growth rate
Exposure time: 72 h
Test Type: static test
Analytical monitoring: yes
Method: OECD Test Guideline 201
GLP: yes
Remarks: The details of the toxic effect relate to the nominal concentration.

NOEC (Desmodesmus subspicatus (green algae)): 5 mg/l
End point: Growth rate
Exposure time: 72 h
Test Type: static test
Analytical monitoring: yes
Method: OECD Test Guideline 201
GLP: yes
Remarks: The details of the toxic effect relate to the nominal concentration.

ErC10 (Desmodesmus subspicatus (green algae)): 6,6 mg/l
End point: Growth rate
Exposure time: 72 h
Test Type: static test
Analytical monitoring: yes
Method: OECD Test Guideline 201
GLP: yes
Remarks: The details of the toxic effect relate to the nominal concentration.

Toxicity to microorganisms : EC50 (activated sludge): > 1.000 mg/l
End point: Bacteria toxicity (respiration inhibition)
Exposure time: 3 h
Test Type: Respiration inhibition
Analytical monitoring: no

Method: OECD Test Guideline 209
GLP: yes

NOEC : 1.000 mg/l
Exposure time: 28 d
Test Type: Other
Analytical monitoring: no
Method: OECD 216
GLP: yes

Toxicity to fish (Chronic toxicity) : Remarks: no data available

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : Remarks: no data available

Toxicity to soil dwelling organisms : Test Type: artificial soil
EC50: 428 mg/kg
Exposure time: 56 d
End point: Reproduction
Species: Eisenia fetida (earthworms)
Method: OECD Test Guideline 222
GLP:yes

Test Type: artificial soil
NOEC: 1.000 mg/kg
Exposure time: 96 h
End point: mortality
Species: Nematode Caenorhabditis elegans
Method: Other
GLP:yes

Sediment toxicity : NOEC: 1000 mg/kg
Duration: 28 d
Sediment: artificial soil
Exposure duration: 28 d
Species: Lumbriculus variegatus (Worm)
Basis for effect: Reproduction
Method: OECD 225
GLP: yes

Tin sulphate:

Toxicity to fish : LC50 (Fish): 9 - 50 mg/l
saltwater
Exposure time: 96 h
Test Type: static test
Method: Other
GLP: No information available.
Remarks: The details of the toxic effect relate to the nominal concentration.

Toxicity to daphnia and other : LC50 (Daphnia magna (Water flea)): 55 mg/l

aquatic invertebrates		dissolved Sn Exposure time: 48 h Test Type: static test Analytical monitoring: yes Method: OECD Test Guideline 202 GLP: no Remarks: By analogy with a product of similar composition
Toxicity to algae/aquatic plants	:	EC50 (Scenedesmus quadricauda (Green algae)): 50 mg/l dissolved Sn Exposure time: 72 h Test Type: static test Analytical monitoring: yes Method: Other GLP: no Remarks: By analogy with a product of similar composition NOEC (Scenedesmus quadricauda (Green algae)): 14 mg/l dissolved Sn Exposure time: 8 d Test Type: static test Analytical monitoring: yes Method: Other GLP: no Remarks: By analogy with a product of similar composition
M-Factor (Acute aquatic toxicity)	:	1
Toxicity to microorganisms	:	EC50 (activated sludge): 1.194 mg/l, substance End point: Bacteria toxicity (respiration inhibition) Exposure time: 3 h Test Type: aquatic Analytical monitoring: no Method: OECD Test Guideline 209 GLP: yes Remarks: The details of the toxic effect relate to the nominal concentration.
Toxicity to fish (Chronic toxicity)	:	NOEC: ca. 3 mg/l, dissolved Sn Exposure time: 120 h Species: Danio rerio (zebra fish) Test Type: static test Analytical monitoring: yes Method: OECD Test Guideline 212 GLP: No information available. Remarks: By analogy with a product of similar composition
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	Remarks: not required
M-Factor (Chronic aquatic toxicity)	:	1

Ecotoxicology Assessment

Chronic aquatic toxicity : Harmful to aquatic life with long lasting effects.

12.2 Persistence and degradability

Product:

Biodegradability : Test Type: Primary biodegradation
Remarks: Not applicable for inorganic compound.

Physico-chemical removability : Remarks: Not applicable due to insolubility in water. This product does not come into contact with the effluent when it is used for its purpose, otherwise it can be removed by filtration operations.

Stability in water : Test Type: abiotic
pH: 4 - 9
Method: OECD Test Guideline 111
GLP: yes
Remarks: Hydrolyses slowly on contact with water.

Components:

Red phosphorus stabilized with tin sulfate:

Biodegradability : Test Type: Primary biodegradation
Remarks: Not applicable for inorganic compound.

Physico-chemical removability : Remarks: Not applicable due to insolubility in water. This product does not come into contact with the effluent when it is used for its purpose, otherwise it can be removed by filtration operations.

Stability in water : Test Type: abiotic
pH: 4 - 9
Method: OECD Test Guideline 111
GLP: yes
Remarks: Hydrolyses slowly on contact with water.

Tin sulphate:

Biodegradability : Remarks: Not applicable

12.3 Bioaccumulative potential

Product:

Bioaccumulation : Remarks: Bioaccumulation is unlikely.

Components:

Red phosphorus stabilized with tin sulfate:

Bioaccumulation : Remarks: Bioaccumulation is unlikely.

Partition coefficient: n-octanol/water	:	Remarks: Not applicable

Tin sulphate:

Bioaccumulation	:	Remarks: Not applicable

12.4 Mobility in soil

Components:

Tin sulphate:

Distribution among environmental compartments	:	Remarks: no data available

12.5 Results of PBT and vPvB assessment

Product:

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

Components:

Red phosphorus stabilized with tin sulfate:

Assessment	:	The substance is inorganic, thus a PBT and vPvB criteria assessment is not applicable according to Annex XIII of Regulation (EC) 1907/2006. .

Tin sulphate:

Assessment	:	Remarks: Not applicable

12.6 Other adverse effects

Product:

Environmental fate and pathways	:	not available
Additional ecological information	:	The product should not be allowed to enter drains, water courses or the soil. Since Red phosphorus is an amorphous polymeric form of elemental phosphorus, it is insoluble in water and organic solvents. However, slow disproportionating and oxidizing reactions produce traces of phosphine (strong smell and is toxic), but mainly phosphorus acids (H3PO4, H3PO3, H3PO2) as well as traces of unknown phosphorus compounds. These reaction products (particularly phosphine) are the cause of the toxic effects to organisms of red phosphorus. These reactions are increased by high temperatures and moisture.

Components:

Red phosphorus stabilized with tin sulfate:

Environmental fate and pathways	:	not available
Additional ecological information	:	The product should not be allowed to enter drains, water courses or the soil. Since Red phosphorus is an amorphous polymeric form of elemental phosphorus, it is insoluble in water and organic solvents. However, slow disproportionating and oxidizing reactions produce traces of phosphine (strong smell and is toxic), but mainly phosphorus acids (H3PO4, H3PO3, H3PO2) as well as traces of unknown phosphorus compounds. These reaction products (particularly phosphine) are the cause of the toxic effects to organisms of red phosphorus. These reactions are increased by high temperatures and moisture.

Tin sulphate:

Environmental fate and pathways	:	no data available
Additional ecological information	:	The product should not be allowed to enter drains, water courses or the soil.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product	:	Contact manufacturer. Special waste incineration plant with flue gas dust scrubber
Contaminated packaging	:	Packaging that cannot be cleaned should be disposed of as product waste Used bags of PE should be wetted outside and inside with water before being destroyed, to avoid dust explosions

SECTION 14: Transport information

Section 14.1. to 14.5.

ADR

UN no.	UN 1338
Proper shipping name:	Phosphorus, amorphous, mixture
Class:	4.1
Primary risk:	4.1
Packing group:	III
Hazard no. :	40
Remarks	Shipment permitted

ADN

UN no.	UN 1338
Proper shipping name:	Phosphorus, amorphous, mixture
Class:	4.1
Primary risk:	4.1
Packing group:	III
Remarks	Shipment permitted

RID

UN no.	UN 1338
Proper shipping name:	Phosphorus, amorphous, mixture
Class:	4.1
Primary risk:	4.1
Packing group:	III
Hazard no. :	40
Remarks	Shipment permitted

IATA

UN no.	UN 1338
Proper shipping name:	Phosphorus, amorphous, mixture
Class:	4.1
Primary risk:	4.1
Packing group:	III
Remarks	Shipment permitted

IMDG

UN no.	UN 1338
Proper shipping name:	Phosphorus, amorphous, mixture
Class:	4.1
Primary risk:	4.1
Packing group:	III
Remarks	Shipment permitted
EmS :	F-A S-G

14.6. Special precautions for user

See sections 6 to 8 of this Safety Data Sheet.

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code (International Bulk Chemicals Code)

No transport as bulk according IBC - Code.

SECTION 15: Regulatory information

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

REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59).	:	Not applicable
REACH - List of substances subject to authorisation (Annex XIV)	:	Not applicable
Regulation (EC) No 1005/2009 on substances that deplete the ozone layer	:	Not applicable

Regulation (EC) No 850/2004 on persistent organic pollutants	:	Not applicable
REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, preparations and articles (Annex XVII)	:	Conditions of restriction for the following entries should be considered: Red phosphorus (Number on list 665)

Other regulations:

Apart from the data/regulations specified in this chapter, no further information is available concerning safety, health and environmental protection.

15.2 Chemical safety assessment

A Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information

Full text of other abbreviations

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road; AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - Substance of Very High Concern; TCSI - Taiwan Chemical Substance Inventory; TRGS - Technical Rule for

Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

Further information

Other information : Observe national and local legal requirements

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REG_EU / EN

Exposure scenario

Number	Title
ES 1	**Formulation or re-packing; Polymer preparations and compounds** PROC2, PROC3, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15 - ERC2, ERC3 Phosphorus red
ES 2	**Industrial use; Application, Polymer preparations and compounds** PROC2, PROC3, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14, PROC15, PROC21, PROC24 - ERC4, ERC5 Phosphorus red
ES 3	**Formulation or re-packing; Manufacture of substance, Use in rubber production and processing** SU8, SU9, SU11 - PROC5, PROC8b, PROC9 - ERC3 Phosphorus red
ES 4	**Industrial use; Application, Use in rubber production and processing** SU8, SU9, SU11 - PROC5, PROC7, PROC8b, PROC9, PROC10, PROC14, PROC21 - ERC3, ERC5 Phosphorus red
ES 5	**Formulation or re-packing; Adhesives, sealants** SU8, SU9 - PROC5, PROC7, PROC8b - ERC2 Phosphorus red
ES 6	**Industrial use; Application, Adhesives, sealants** SU8, SU9 - PROC10 - ERC5 Phosphorus red
ES 7	**Professional use; Application, Adhesives, sealants** PC1 - ERC8c Phosphorus red
ES 8	**Industrial use; Formulation into mixture, Matches** SU8, SU9 - PROC5, PROC8b, PROC10, PROC13 - ERC2 Phosphorus red
ES 9	**Industrial use; Application, Matches** SU8, SU9 - PROC5, PROC8b, PROC10, PROC13 - ERC3 Phosphorus red
ES 10	**Industrial use; Manufacture of substance, Biocidal products** SU8, SU9 - PROC5, PROC8b, PROC10, PROC13 - ERC2, ERC3 Phosphorus red
ES 11	**Industrial use; Application, Use as an intermediate, Base metals and alloys** SU8, SU9 - PROC1, PROC2, PROC3, PROC4, PROC8b, PROC9, PROC15 - ERC6a Phosphorus red

1. ES 1: Formulation or re-packing; Polymer preparations and compounds

1.1. Title section

Environment		
CS1:	Formulation or re-packing (Formulation into mixture, Formulation into solid matrix)	ERC2, ERC3
Workers		
CS2:	Formulation or re-packing (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, Mixing or blending in batch processes, Transfer of substance or mixture (charging/discharging) at non dedicated-facilities, Transfer of substance or mixture (charging/discharging) at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing), Tabletting, compression, extrusion, pelettisation, granulation, Use as laboratory reagent)	PROC2, PROC3, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15

1.2. ES 1 Conditions of use affecting exposure

1.2.1 ES 1 - CS 1: Control of environmental exposure: Formulation or re-packing (Formulation into mixture, Formulation into solid matrix) (ERC2, ERC3)

Product characteristics
Molecular weight : 31 g/mol

Amount used
Daily amount per site : 66,7 kg/day

Frequency and duration of use
Continuous exposure : 1 uses per day

Continuous exposure : 300 times per year

Environment factors not influenced by risk management
Flow rate of receiving surface water : 18.000 m3/d

Technical conditions and measures / Organizational measures
Air : Filtration (Effectiveness (of a measure): > 99 %)

Water : Sedimentation (Effectiveness (of a measure): > 80 %)

Remarks	:	Ensure operatives are trained to minimise exposures. Ensure control measures are regularly inspected and maintained.

Conditions and measures related to sewage treatment plant

Flow rate of sewage treatment plant effluent	:	2.000 m3/d
Sludge Treatment	:	No application of sewage sludge to soil

Waste management measures

Waste treatment	:	Incineration
Disposal methods	:	(Effectiveness (of a measure): > 99 %)

1.2.2 ES 1 - CS 2: Control of worker exposure: Formulation or re-packing (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, Mixing or blending in batch processes, Transfer of substance or mixture (charging/discharging) at non dedicated-facilities, Transfer of substance or mixture (charging/discharging) at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing), Tabletting, compression, extrusion, pelettisation, granulation, Use as laboratory reagent) (PROC2, PROC3, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15)

Remarks	:	As no toxicological hazard was identified no human-related (worker/consumer) exposure assessment and risk characterization was performed.

Product characteristics

Concentration of the Substance in Mixture/Article	:	<= 100 %
Molecular weight	:	31 g/mol
Physical Form (at time of use)	:	Solid, medium dustiness
Vapour pressure	:	< 0,001 Pa
Remarks	:	Elevated temperature

1.3. ES 1 Exposure estimation and reference to its source

1.3.1 ES 1 - CS 1: Environmental release and exposure: Formulation or re-packing (Formulation into mixture, Formulation into solid matrix) (ERC2, ERC3)

Release route	Release rate	Release estimation method
Air	0 kg/day	EUSES v2.1
Water	0,00667 kg/day	EUSES v2.1
Waste	0 kg/day	EUSES v2.1

protection target	Exposure estimation and reference to its source (EUSES v2.1)	RCR
Freshwater	0,000037 µg/L	< 0,01
Freshwater sediment	370 µg/kg dry weight	< 0,01
Soil	139 µg/kg dry weight	0,0111
Sewage treatment plant	0,05 µg/L	< 0,01
Secondary poisoning	Not applicable	
Indirect exposure to humans via the environment	Not applicable	

1.4. ES 1 Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

ECHA guidance for downstream users
Section 2

2. ES 2: Industrial use; Application, Polymer preparations and compounds

2.1. Title section

Environment		
CS1:	Industrial use (Use of non-reactive processing aid at industrial site (no inclusion into or onto article), Use at industrial site leading to inclusion into/onto article)	ERC4, ERC5
Workers		
CS2:	Industrial use (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, Mixing or blending in batch processes, Industrial spraying, Transfer of substance or mixture (charging/discharging) at non dedicated-facilities, Transfer of substance or mixture (charging/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, Tabletting, compression, extrusion, pelettisation, granulation, Use as laboratory reagent, Low energy manipulation and handling of substances bound in/on materials and/or articles, High (mechanical) energy work-up of substances bound in/on materials and/or articles)	PROC2, PROC3, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14, PROC15, PROC21, PROC24

2.2. ES 2 Conditions of use affecting exposure

2.2.1 ES 2 - CS 1: Control of environmental exposure: Industrial use (Use of non-reactive processing aid at industrial site (no inclusion into or onto article), Use at industrial site leading to inclusion into/onto article) (ERC4, ERC5)

Product characteristics

Molecular weight	:	31 g/mol

Amount used

Daily amount per site	:	66,7 kg/day

Frequency and duration of use

Continuous exposure	:	1 uses per day
Continuous exposure	:	300 times per year

Environment factors not influenced by risk management

Flow rate of receiving surface water	:	18.000 m3/d

Technical conditions and measures / Organizational measures

Air	:	Filtration (Effectiveness (of a measure): > 99 %)
Water	:	Sedimentation (Effectiveness (of a measure): > 80 %)
Remarks	:	Ensure operatives are trained to minimise exposures. Ensure control measures are regularly inspected and maintained.

Conditions and measures related to sewage treatment plant

Flow rate of sewage treatment plant effluent	:	2.000 m3/d
Sludge Treatment	:	No application of sewage sludge to soil

Waste management measures

Waste treatment	:	Incineration
Disposal methods	:	(Effectiveness (of a measure): > 99 %)

2.2.2 ES 2 - CS 2: Control of worker exposure: Industrial use (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, Mixing or blending in batch processes, Industrial spraying, Transfer of substance or mixture (charging/discharging) at non dedicated-facilities, Transfer of substance or mixture (charging/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, Tabletting, compression, extrusion, pelettisation, granulation, Use as laboratory reagent, Low energy manipulation and handling of substances bound in/on materials and/or articles, High (mechanical) energy work-up of substances bound in/on materials and/or articles) (PROC2, PROC3, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13,

PROC14, PROC15, PROC21, PROC24)

Remarks : As no toxicological hazard was identified no human-related (worker/consumer) exposure assessment and risk characterization was performed.

Product characteristics

Concentration of the Substance in Mixture/Article : >= 5 - <= 25 %

Molecular weight : 31 g/mol
Physical Form (at time of use) : Solid, low dustiness
Vapour pressure : < 0,001 Pa
Remarks : Covers use at ambient temperatures.

2.3. ES 2 Exposure estimation and reference to its source

2.3.1 ES 2 - CS 1: Environmental release and exposure: Industrial use (Use of non-reactive processing aid at industrial site (no inclusion into or onto article), Use at industrial site leading to inclusion into/onto article) (ERC4, ERC5)

Release route	Release rate	Release estimation method
Air	0 kg/day	EUSES v2.1
Water	0,000667 kg/day	EUSES v2.1
Waste	0 kg/day	EUSES v2.1

protection target	Exposure estimation and reference to its source (EUSES v2.1)	RCR
Freshwater	0,0000074 µg/L	< 0,01
Freshwater sediment	74 µg/kg dry weight	< 0,01
Soil	14,1 µg/kg dry weight	< 0,01
Sewage treatment plant	0,005 µg/L	< 0,01
Secondary poisoning	Not applicable	
Indirect exposure to humans via the environment	Not applicable	

2.4. ES 2 Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

ECHA guidance for downstream users
Section 2

3. ES 3: Formulation or re-packing; Manufacture of

substance, Use in rubber production and processing; SU8, SU9, SU11

3.1. Title section

Manufacture of bulk, large scale chemicals (including petroleum products) (SU8) Manufacture of fine chemicals (SU9) Manufacture of rubber products (SU11)	
Environment	
CS1: Formulation or re-packing (Formulation into solid matrix)	ERC3
Workers	
CS2: Formulation or re-packing (Mixing or blending in batch processes, Transfer of substance or mixture (charging/discharging) at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing))	PROC5, PROC8b, PROC9

3.2. ES 3 Conditions of use affecting exposure

3.2.1 ES 3 - CS 1: Control of environmental exposure: Formulation or re-packing (Formulation into solid matrix) (ERC3)

Product characteristics

Molecular weight	:	31 g/mol

Amount used

Daily amount per site	:	66,7 kg/day

Frequency and duration of use

Continuous exposure	:	1 uses per day
Continuous exposure	:	300 times per year

Environment factors not influenced by risk management

Flow rate of receiving surface water	:	18.000 m3/d

Technical conditions and measures / Organizational measures

Air	:	Filtration (Effectiveness (of a measure): > 99 %)
Water	:	Sedimentation (Effectiveness (of a measure): > 80 %)
Remarks	:	Ensure operatives are trained to minimise exposures. Ensure control measures are regularly inspected and maintained.

Conditions and measures related to sewage treatment plant

Flow rate of sewage treatment plant effluent	:	2.000 m3/d
Sludge Treatment	:	No application of sewage sludge to soil

Waste management measures

Waste treatment	:	Incineration
Disposal methods	:	(Effectiveness (of a measure): > 99 %)

3.2.2 ES 3 - CS 2: Control of worker exposure: Formulation or re-packing (Mixing or blending in batch processes, Transfer of substance or mixture (charging/discharging) at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing)) (PROC5, PROC8b, PROC9)

Remarks	:	As no toxicological hazard was identified no human-related (worker/consumer) exposure assessment and risk characterization was performed.

Product characteristics

Concentration of the Substance in Mixture/Article	:	>= 5 - <= 25 %
Molecular weight	:	31 g/mol
Physical Form (at time of use)	:	Solid, low dustiness
Vapour pressure	:	< 0,001 Pa
Remarks	:	Covers use at ambient temperatures.

3.3. ES 3 Exposure estimation and reference to its source

3.3.1 ES 3 - CS 1: Environmental release and exposure: Formulation or re-packing (Formulation into solid matrix) (ERC3)

Release route	Release rate	Release estimation method
Air	0 kg/day	EUSES v2.1
Water	0,00667 kg/day	EUSES v2.1
Waste	0 kg/day	EUSES v2.1

protection target	Exposure estimation and reference to its source (EUSES v2.1)	RCR
Freshwater	0,00018 µg/L	< 0,01
Freshwater sediment	1800 µg/kg dry weight	0,018
Soil	130 µg/kg dry weight	0,01
Sewage treatment plant	0,27 µg/L	< 0,01
Secondary poisoning	Not applicable	
Indirect exposure to humans via the environment	Not applicable	

3.4. ES 3 Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

ECHA guidance for downstream users
Section 2

4. ES 4: Industrial use; Application, Use in rubber production and processing; SU8, SU9, SU11

4.1. Title section

Manufacture of bulk, large scale chemicals (including petroleum products) (SU8) Manufacture of fine chemicals (SU9) Manufacture of rubber products (SU11)		
Environment		
CS1:	Industrial use (Formulation into solid matrix, Use at industrial site leading to inclusion into/onto article)	ERC3, ERC5
Workers		
CS2:	Industrial use (Mixing or blending in batch processes, Industrial spraying, Transfer of substance or mixture (charging/discharging) at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing), Roller application or brushing, Tabletting, compression, extrusion, pelettisation, granulation, Low energy manipulation and handling of substances bound in/on materials and/or articles)	PROC5, PROC7, PROC8b, PROC9, PROC10, PROC14, PROC21

4.2. ES 4 Conditions of use affecting exposure

4.2.1 ES 4 - CS 1: Control of environmental exposure: Industrial use (Formulation into solid matrix, Use at industrial site leading to inclusion into/onto article) (ERC3, ERC5)

Product characteristics

Molecular weight : 31 g/mol

Amount used

Daily amount per site : 66,7 kg/day

Frequency and duration of use

Continuous exposure : 1 uses per day

Continuous exposure : 300 times per year

Environment factors not influenced by risk management

Flow rate of receiving surface water : 18.000 m3/d

Technical conditions and measures / Organizational measures

Air	:	Filtration (Effectiveness (of a measure): > 99 %)
Water	:	Sedimentation (Effectiveness (of a measure): > 80 %)
Remarks	:	Ensure operatives are trained to minimise exposures. Ensure control measures are regularly inspected and maintained.

Conditions and measures related to sewage treatment plant

Flow rate of sewage treatment plant effluent	:	2.000 m3/d
Sludge Treatment	:	No application of sewage sludge to soil

Waste management measures

Waste treatment	:	Incineration
Disposal methods	:	(Effectiveness (of a measure): > 99 %)

4.2.2 ES 4 - CS 2: Control of worker exposure: Industrial use (Mixing or blending in batch processes, Industrial spraying, Transfer of substance or mixture (charging/discharging) at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing), Roller application or brushing, Tabletting, compression, extrusion, pelettisation, granulation, Low energy manipulation and handling of substances bound in/on materials and/or articles) (PROC5, PROC7, PROC8b, PROC9, PROC10, PROC14, PROC21)

Remarks	:	As no toxicological hazard was identified no human-related (worker/consumer) exposure assessment and risk characterization was performed.

Product characteristics

Concentration of the Substance in Mixture/Article	:	>= 5 - <= 25 %
Molecular weight	:	31 g/mol
Physical Form (at time of use)	:	Solid, low dustiness
Vapour pressure	:	< 0,001 Pa
Remarks	:	Covers use at ambient temperatures.

4.3. ES 4 Exposure estimation and reference to its source

4.3.1 ES 4 - CS 1: Environmental release and exposure: Industrial use (Formulation into solid matrix, Use at industrial site leading to inclusion into/onto article) (ERC3, ERC5)

Release route	Release rate	Release estimation method
Air	0 kg/day	EUSES v2.1
Water	0,000667 kg/day	EUSES v2.1
Waste	0 kg/day	EUSES v2.1

protection target	Exposure estimation and reference to its source (EUSES v2.1)	RCR
Freshwater	0,000022 µg/L	< 0,01
Freshwater sediment	220 µg/kg dry weight	0,011
Soil	13,2 µg/kg dry weight	< 0,01
Sewage treatment plant	0,027 µg/L	< 0,01
Secondary poisoning	Not applicable	
Indirect exposure to humans via the environment	Not applicable	

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

ECHA guidance for downstream users
Section 2

5. ES 5: Formulation or re-packing; Adhesives, sealants; SU8, SU9

5.1. Title section

Manufacture of bulk, large scale chemicals (including petroleum products) (SU8) Manufacture of fine chemicals (SU9)	
Environment	
CS1: Formulation or re-packing (Formulation into mixture)	ERC2
Workers	
CS2: Formulation or re-packing (Mixing or blending in batch processes, Industrial spraying, Transfer of substance or mixture (charging/discharging) at dedicated facilities)	PROC5, PROC7, PROC8b

5.2. ES 5 Conditions of use affecting exposure

5.2.1 ES 5 - CS 1: Control of environmental exposure: Formulation or re-packing (Formulation into mixture) (ERC2)

Product characteristics
Molecular weight : 31 g/mol

Amount used
Daily amount per site : 16,7 kg/day

Frequency and duration of use
Continuous exposure : 1 uses per day

Continuous exposure : 300 times per year

Environment factors not influenced by risk management
Flow rate of receiving surface water : 18.000 m3/d

Technical conditions and measures / Organizational measures
Air : Filtration (Effectiveness (of a measure): > 99 %)

Water : Sedimentation (Effectiveness (of a measure): > 80 %)

Remarks : Ensure operatives are trained to minimise exposures. Ensure control measures are regularly inspected and maintained.

Conditions and measures related to sewage treatment plant
Flow rate of sewage treatment plant effluent : 2.000 m3/d
Sludge Treatment : No application of sewage sludge to soil

Waste management measures
Waste treatment : Incineration
Disposal methods : (Effectiveness (of a measure): > 99 %)

5.2.2 ES 5 - CS 2: Control of worker exposure: Formulation or re-packing (Mixing or blending in batch processes, Industrial spraying, Transfer of substance or mixture (charging/discharging) at dedicated facilities) (PROC5, PROC7, PROC8b)

Remarks : As no toxicological hazard was identified no human-related (worker/consumer) exposure assessment and risk characterization was performed.

Product characteristics
Concentration of the Substance in Mixture/Article : >= 5 - <= 25 %

Molecular weight : 31 g/mol
Physical Form (at time of use) : Solid, low dustiness
Vapour pressure : < 0,001 Pa
Remarks : Covers use at ambient temperatures.

5.3. ES 5 Exposure estimation and reference to its source

5.3.1 ES 5 - CS 1: Environmental release and exposure: Formulation or re-packing (Formulation into mixture) (ERC2)

Release route	Release rate	Release estimation method
Air	0 kg/day	EUSES v2.1

Water	0,00167 kg/day	EUSES v2.1
Waste	0 kg/day	EUSES v2.1

protection target	Exposure estimation and reference to its source (EUSES v2.1)	RCR
Freshwater	0,000048 µg/L	< 0,01
Freshwater sediment	480 µg/kg dry weight	< 0,01
Soil	32,6 µg/kg dry weight	< 0,01
Sewage treatment plant	0,067 µg/L	< 0,01
Secondary poisoning	Not applicable	
Indirect exposure to humans via the environment	Not applicable	

5.4. ES 5 Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

ECHA guidance for downstream users
Section 2

6. ES 6: Industrial use; Application, Adhesives, sealants; SU8, SU9

6.1. Title section

Manufacture of bulk, large scale chemicals (including petroleum products) (SU8) Manufacture of fine chemicals (SU9)	
Environment	
CS1: Industrial use (Use at industrial site leading to inclusion into/onto article)	ERC5
Workers	
CS2: Industrial use (Roller application or brushing)	PROC10

6.2. ES 6 Conditions of use affecting exposure

6.2.1 ES 6 - CS 1: Control of environmental exposure: Industrial use (Use at industrial site leading to inclusion into/onto article) (ERC5)

Product characteristics
Molecular weight : 31 g/mol

Amount used
Daily amount per site : 8,3 kg/day

Frequency and duration of use

Continuous exposure : 1 uses per day

Continuous exposure : 300 times per year

Environment factors not influenced by risk management
Flow rate of receiving surface water : 18.000 m3/d

Technical conditions and measures / Organizational measures
Air : Filtration (Effectiveness (of a measure): > 99 %)

Water : Sedimentation (Effectiveness (of a measure): > 80 %)

Remarks : Ensure operatives are trained to minimise exposures. Ensure control measures are regularly inspected and maintained.

Conditions and measures related to sewage treatment plant
Flow rate of sewage treatment plant effluent : 2.000 m3/d
Sludge Treatment : No application of sewage sludge to soil

Waste management measures
Waste treatment : Incineration
Disposal methods : (Effectiveness (of a measure): > 99 %)

6.2.2 ES 6 - CS 2: Control of worker exposure: Industrial use (Roller application or brushing) (PROC10)

Remarks : As no toxicological hazard was identified no human-related (worker/consumer) exposure assessment and risk characterization was performed.

Product characteristics
Concentration of the Substance in Mixture/Article : >= 5 - <= 25 %

Molecular weight : 31 g/mol
Physical Form (at time of use) : Solid, low dustiness
Vapour pressure : < 0,001 Pa
Remarks : Covers use at ambient temperatures.

6.3. ES 6 Exposure estimation and reference to its source

6.3.1 ES 6 - CS 1: Environmental release and exposure: Industrial use (Use at industrial site leading to inclusion into/onto article) (ERC5)

Release route	Release rate	Release estimation method
Air	0 kg/day	EUSES v2.1

Water	0,000083 kg/day	EUSES v2.1
Waste	0 kg/day	EUSES v2.1

protection target	Exposure estimation and reference to its source (EUSES v2.1)	RCR
Freshwater	0,000022 µg/L	< 0,01
Freshwater sediment	47,0 µg/kg dry weight	< 0,01
Soil	11,6 µg/kg dry weight	< 0,01
Sewage treatment plant	0,067 µg/L	< 0,01
Secondary poisoning	Not applicable	
Indirect exposure to humans via the environment	Not applicable	

6.4. ES 6 Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

ECHA guidance for downstream users
Section 2

7. ES 7: Professional use; Application, Adhesives, sealants

7.1. Title section

Adhesives, sealants (PC1)	
Environment	
CS1: Professional use (Widespread use leading to inclusion into/onto article (indoor))	ERC8c
Workers	
CS2: Professional use (Adhesives, sealants)	PC1

7.2. ES 7 Conditions of use affecting exposure

7.2.1 ES 7 - CS 1: Control of environmental exposure: Professional use (Widespread use leading to inclusion into/onto article (indoor)) (ERC8c)

Product characteristics
Molecular weight : 31 g/mol

Amount used
Amounts used : 0,8 kg/day

Frequency and duration of use
Continuous exposure : 1 uses per day

Continuous exposure : 300 times per year

Environment factors not influenced by risk management
Flow rate of receiving surface water : 18.000 m3/d

Technical conditions and measures / Organizational measures
Remarks : Ensure control measures are regularly inspected and maintained.

Conditions and measures related to sewage treatment plant
Flow rate of sewage treatment plant effluent : 2.000 m3/d

Waste management measures
Waste treatment : Incineration
Disposal methods : (Effectiveness (of a measure): > 99 %)
Waste treatment : Landfill, Not applicable
Waste treatment : Recycling, Not applicable

7.2.2 ES 7 - CS 2: Control of worker exposure: Professional use (Adhesives, sealants) (PC1)

Remarks : As no toxicological hazard was identified no human-related (worker/consumer) exposure assessment and risk characterization was performed.

Product characteristics
Concentration of the Substance in Mixture/Article : >= 5 - <= 25 %

Molecular weight : 31 g/mol
Physical Form (at time of use) : Solid, low dustiness
Vapour pressure : < 0,001 Pa
Remarks : Covers use at ambient temperatures.

7.3. ES 7 Exposure estimation and reference to its source

7.3.1 ES 7 - CS 1: Environmental release and exposure: Professional use (Widespread use leading to inclusion into/onto article (indoor)) (ERC8c)

Release route	Release rate	Release estimation method
Air	0 kg/day	EUSES v2.1
Water	0,000008 kg/day	EUSES v2.1
Waste	0 kg/day	EUSES v2.1

protection target	Exposure estimation and reference to its source (EUSES v2.1)	RCR

Freshwater	0,0000043 µg/L	< 0,01
Freshwater sediment	43,0 µg/kg dry weight	< 0,01
Soil	0,406 µg/kg dry weight	< 0,01
Sewage treatment plant	0,00033 µg/L	< 0,01
Secondary poisoning	Not applicable	
Indirect exposure to humans via the environment	Not applicable	

7.4. ES 7 Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

ECHA guidance for downstream users
Section 2

8. ES 8: Industrial use; Formulation into mixture, Matches; SU8, SU9

8.1. Title section

Manufacture of bulk, large scale chemicals (including petroleum products) (SU8) Manufacture of fine chemicals (SU9)	
Environment	
CS1: Industrial use (Formulation into mixture)	ERC2
Workers	
CS2: Industrial use (Mixing or blending in batch processes, Transfer of substance or mixture (charging/discharging) at dedicated facilities, Roller application or brushing, Treatment of articles by dipping and pouring)	PROC5, PROC8b, PROC10, PROC13

8.2. ES 8 Conditions of use affecting exposure

8.2.1 ES 8 - CS 1: Control of environmental exposure: Industrial use (Formulation into mixture) (ERC2)

Product characteristics
Molecular weight : 31 g/mol

Amount used
Daily amount per site : 26,7 kg/day

Frequency and duration of use
Continuous exposure : 1 uses per day

Continuous exposure : 300 times per year

Environment factors not influenced by risk management
Flow rate of receiving surface water : 18.000 m3/d

Technical conditions and measures / Organizational measures
Air : Filtration (Effectiveness (of a measure): > 99 %)

Water : Sedimentation (Effectiveness (of a measure): > 80 %)

Remarks : Ensure operatives are trained to minimise exposures. Ensure control measures are regularly inspected and maintained.

Conditions and measures related to sewage treatment plant
Flow rate of sewage treatment plant effluent : 2.000 m3/d
Sludge Treatment : No application of sewage sludge to soil

Waste management measures
Waste treatment : Incineration
Disposal methods : (Effectiveness (of a measure): > 99 %)

8.2.2 ES 8 - CS 2: Control of worker exposure: Industrial use (Mixing or blending in batch processes, Transfer of substance or mixture (charging/discharging) at dedicated facilities, Roller application or brushing, Treatment of articles by dipping and pouring) (PROC5, PROC8b, PROC10, PROC13)

Remarks : As no toxicological hazard was identified no human-related (worker/consumer) exposure assessment and risk characterization was performed.

Product characteristics
Concentration of the Substance in Mixture/Article : >= 5 - <= 25 %

Molecular weight : 31 g/mol
Physical Form (at time of use) : Solid, low dustiness
Vapour pressure : < 0,001 Pa
Remarks : Covers use at ambient temperatures.

8.3. ES 8 Exposure estimation and reference to its source

8.3.1 ES 8 - CS 1: Environmental release and exposure: Industrial use (Formulation into mixture) (ERC2)

Release route	Release rate	Release estimation method
Air	0 kg/day	EUSES v2.1

Water	0,00267 kg/day	EUSES v2.1
Waste	0 kg/day	EUSES v2.1

protection target	Exposure estimation and reference to its source (EUSES v2.1)	RCR
Freshwater	0,000075 µg/L	< 0,01
Freshwater sediment	750,0 µg/kg dry weight	< 0,01
Soil	52,0 µg/kg dry weight	< 0,01
Sewage treatment plant	0,11 µg/L	< 0,01
Secondary poisoning	Not applicable	
Indirect exposure to humans via the environment	Not applicable	

8.4. ES 8 Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

ECHA guidance for downstream users
Section 2

9. ES 9: Industrial use; Application, Matches; SU8, SU9

9.1. Title section

Manufacture of bulk, large scale chemicals (including petroleum products) (SU8) Manufacture of fine chemicals (SU9)	
Environment	
CS1: Industrial use (Formulation into solid matrix)	ERC3
Workers	
CS2: Industrial use (Mixing or blending in batch processes, Transfer of substance or mixture (charging/discharging) at dedicated facilities, Roller application or brushing, Treatment of articles by dipping and pouring)	PROC5, PROC8b, PROC10, PROC13

9.2. ES 9 Conditions of use affecting exposure

9.2.1 ES 9 - CS 1: Control of environmental exposure: Industrial use (Formulation into solid matrix) (ERC3)

Product characteristics
Molecular weight : 31 g/mol

Amount used
Daily amount per site : 26,7 kg/day

Frequency and duration of use

Continuous exposure	:	1 uses per day
Continuous exposure	:	300 times per year

Environment factors not influenced by risk management

Flow rate of receiving surface water	:	18.000 m3/d

Technical conditions and measures / Organizational measures

Air	:	Filtration (Effectiveness (of a measure): > 99 %)
Water	:	Sedimentation (Effectiveness (of a measure): > 80 %)
Remarks	:	Ensure operatives are trained to minimise exposures. Ensure control measures are regularly inspected and maintained.

Conditions and measures related to sewage treatment plant

Flow rate of sewage treatment plant effluent	:	2.000 m3/d
Sludge Treatment	:	No application of sewage sludge to soil

Waste management measures

Waste treatment	:	Incineration
Disposal methods	:	(Effectiveness (of a measure): > 99 %)

9.2.2 ES 9 - CS 2: Control of worker exposure: Industrial use (Mixing or blending in batch processes, Transfer of substance or mixture (charging/discharging) at dedicated facilities, Roller application or brushing, Treatment of articles by dipping and pouring) (PROC5, PROC8b, PROC10, PROC13)

Remarks	:	As no toxicological hazard was identified no human-related (worker/consumer) exposure assessment and risk characterization was performed.

Product characteristics

Concentration of the Substance in Mixture/Article	:	>= 5 - <= 25 %
Molecular weight	:	31 g/mol
Physical Form (at time of use)	:	Solid, low dustiness
Vapour pressure	:	< 0,001 Pa
Remarks	:	Covers use at ambient temperatures.

9.3. ES 9 Exposure estimation and reference to its source

9.3.1 ES 9 - CS 1: Environmental release and exposure: Industrial use (Formulation

into solid matrix) (ERC3)

Release route	Release rate	Release estimation method
Air	0 kg/day	EUSES v2.1
Water	0,000267 kg/day	EUSES v2.1
Waste	0 kg/day	EUSES v2.1

protection target	Exposure estimation and reference to its source (EUSES v2.1)	RCR
Freshwater	0,000011 µg/L	< 0,01
Freshwater sediment	24,0 µg/kg dry weight	< 0,01
Soil	5,42 µg/kg dry weight	< 0,01
Sewage treatment plant	0,011 µg/L	< 0,01
Secondary poisoning	Not applicable	
Indirect exposure to humans via the environment	Not applicable	

9.4. ES 9 Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

ECHA guidance for downstream users
Section 2

10. ES 10: Industrial use; Manufacture of substance, Biocidal products; SU8, SU9

10.1. Title section

Manufacture of bulk, large scale chemicals (including petroleum products) (SU8) Manufacture of fine chemicals (SU9)	
Environment	
CS1: Industrial use (Formulation into mixture, Formulation into solid matrix)	ERC2, ERC3
Workers	
CS2: Industrial use (Mixing or blending in batch processes, Transfer of substance or mixture (charging/discharging) at dedicated facilities, Roller application or brushing, Treatment of articles by dipping and pouring)	PROC5, PROC8b, PROC10, PROC13

10.2. ES 10 Conditions of use affecting exposure

10.2.1 ES 10 - CS 1: Control of environmental exposure: Industrial use (Formulation into mixture, Formulation into solid matrix) (ERC2, ERC3)

Product characteristics
Molecular weight : 31 g/mol

Amount used
Daily amount per site : 333,3 kg/day

Frequency and duration of use
Continuous exposure : 1 uses per day

Continuous exposure : 300 times per year

Environment factors not influenced by risk management
Flow rate of receiving surface water : 18.000 m3/d

Technical conditions and measures / Organizational measures
Air : Filtration (Effectiveness (of a measure): > 99 %)

Water : Sedimentation (Effectiveness (of a measure): > 80 %)

Remarks : Ensure operatives are trained to minimise exposures. Ensure control measures are regularly inspected and maintained.

Conditions and measures related to sewage treatment plant
Flow rate of sewage treatment plant effluent : 2.000 m3/d
Sludge Treatment : No application of sewage sludge to soil

Waste management measures
Waste treatment : Incineration
Disposal methods : (Effectiveness (of a measure): > 99 %)

10.2.2 ES 10 - CS 2: Control of worker exposure: Industrial use (Mixing or blending in batch processes, Transfer of substance or mixture (charging/discharging) at dedicated facilities, Roller application or brushing, Treatment of articles by dipping and pouring) (PROC5, PROC8b, PROC10, PROC13)

Remarks : As no toxicological hazard was identified no human-related (worker/consumer) exposure assessment and risk characterization was performed.

Product characteristics
Concentration of the Substance in Mixture/Article : <= 100 %

Molecular weight : 31 g/mol
Physical Form (at time of use) : Solid, medium dustiness
Vapour pressure : < 0,001 Pa
Remarks : Covers use at ambient temperatures.

10.3. ES 10 Exposure estimation and reference to its source

10.3.1 ES 10 - CS 1: Environmental release and exposure: Industrial use (Formulation into mixture, Formulation into solid matrix) (ERC2, ERC3)

Release route	Release rate	Release estimation method
Air	0 kg/day	EUSES v2.1
Water	0,000333 kg/day	EUSES v2.1
Waste	0 kg/day	EUSES v2.1

protection target	Exposure estimation and reference to its source (EUSES v2.1)	RCR
Freshwater	0,0000057 µg/L	< 0,01
Freshwater sediment	57,0 µg/kg dry weight	< 0,01
Soil	7,16 µg/kg dry weight	< 0,01
Sewage treatment plant	0,0025 µg/L	< 0,01
Secondary poisoning	Not applicable	
Indirect exposure to humans via the environment	Not applicable	

10.4. ES 10 Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

ECHA guidance for downstream users
Section 2

11. ES 11: Industrial use; Application, Use as an intermediate, Base metals and alloys; SU8, SU9

11.1. Title section

Manufacture of bulk, large scale chemicals (including petroleum products) (SU8) Manufacture of fine chemicals (SU9)	
Environment	
CS1: Industrial use (Use of intermediate)	ERC6a
Workers	
CS2: Industrial use (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	PROC1, PROC2, PROC3, PROC4, PROC8b, PROC9, PROC15

exposure or processes with equivalent containment condition, Chemical production where opportunity for exposure arises, Transfer of substance or mixture (charging/discharging) at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing), Use as laboratory reagent)

11.2. ES 11 Conditions of use affecting exposure

11.2.1 ES 11 - CS 1: Control of environmental exposure: Industrial use (Use of intermediate) (ERC6a)

Product characteristics

Molecular weight	:	31 g/mol

Amount used

Daily amount per site	:	33,3 kg/day

Frequency and duration of use

Continuous exposure	:	1 uses per day
Continuous exposure	:	300 times per year

Environment factors not influenced by risk management

Flow rate of receiving surface water	:	18.000 m3/d

Technical conditions and measures / Organizational measures

Air	:	Filtration (Effectiveness (of a measure): > 99 %)
Water	:	Sedimentation (Effectiveness (of a measure): > 80 %)
Remarks	:	Ensure operatives are trained to minimise exposures. Ensure control measures are regularly inspected and maintained.

Conditions and measures related to sewage treatment plant

Flow rate of sewage treatment plant effluent	:	2.000 m3/d
Sludge Treatment	:	No application of sewage sludge to soil

Waste management measures

Waste treatment	:	Incineration
Disposal methods	:	(Effectiveness (of a measure): > 99 %)

11.2.2 ES 11 - CS 2: Control of worker exposure: Industrial use (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, Transfer of substance or mixture (charging/discharging) at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing), Use as laboratory reagent) (PROC1, PROC2, PROC3, PROC4, PROC8b, PROC9, PROC15)

Remarks : As no toxicological hazard was identified no human-related (worker/consumer) exposure assessment and risk characterization was performed.

Product characteristics

Concentration of the Substance in Mixture/Article : <= 100 %

Molecular weight : 31 g/mol
Physical Form (at time of use) : Solid, medium dustiness
Vapour pressure : < 0,001 Pa
Remarks : Covers use at ambient temperatures.

11.3. ES 11 Exposure estimation and reference to its source

11.3.1 ES 11 - CS 1: Environmental release and exposure: Industrial use (Use of intermediate) (ERC6a)

Release route	Release rate	Release estimation method
Air	0 kg/day	EUSES v2.1
Water	0 kg/day	EUSES v2.1
Waste	0 kg/day	EUSES v2.1

protection target	Exposure estimation and reference to its source (EUSES v2.1)	RCR
Freshwater	0 µg/L	0
Freshwater sediment	0 µg/kg dry weight	0
Soil	0 µg/kg dry weight	0
Sewage treatment plant	0 µg/L	0
Secondary poisoning	Not applicable	
Indirect exposure to humans via the environment	Not applicable	

11.4. ES 11 Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

ECHA guidance for downstream users
Section 2