SAFETY DATA SHEET

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

1.1. Product identifier

Name of the substance	Sulphur
Trade name of the substance	SULFUR TECHNICAL GRADE AS TABLETS
Identification number	016-094-00-1 (Index number)
Registration number	01-2119487295-27-0040
Synonyms	None.
Issue date	04-May-2011
Version number	08
Revision date	18-FEB-2021
Supersedes date	11-November-2020

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

Identified uses	Industrial, professional and consumer use. Other registered uses, for this product, can be found in section 15 of this eSDS.
Uses advised against	None known.

1.3. Details of the supplier of the safety data sheet

Supplier

Company name	LUKOIL Neftohim Burgas AD
Address	Burgas 8104, Bulgaria
Telephone	+359 5511 5654
Fax	+359 5511 5555
e-mail	SDS@neftochim.bg
Contact person	REACH@neftochim.bg

1.4. Emergency telephone number	+1-760-476-3961 (available 24 hours a day)
Access code	333368
General in EU	112 (Available 24 hours a day. SDS/Product information may not be available for the Emergency Service.)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 as amended

Health hazards

Skin corrosion/irritation	Category 2	H315 - Causes skin irritation.

Hazard summary Causes skin irritation. Occupational exposure to the substance or mixture may cause adverse health effects. Fine particles may form explosive mixtures with air.

2.2. Label elements

Label according to Regulation (EC) No. 1272/2008 as amended

Contains: Sulphur

Hazard pictograms

Signal word Warning

Hazard statements

H315 Causes skin irritation.

Precautionary statements

Prevention

P280 Wear protective gloves/protective clothing/eye protection/face protection.

Response

P302 + P352	IF ON SKIN: Wash with plenty of water.
P332 + P313	If skin irritation occurs: Get medical advice/attention.

Storage Not assigned.

Disposal Not assigned.

Supplemental label information None.

2.3. Other hazards Not a PBT or vPvB substance or mixture.

SECTION 3: Composition/information on ingredients

3.1. Substances

General information

Chemical name	%	CAS-No. / EC No.	REACH Registration No.	Index No.	Notes
Sulphur	100	7704-34-9 231-722-6	01-2119487295-27-0040	016-094-00-1	

Classification: Skin Irrit. 2;H315

Composition comments The full text for all H-statements is displayed in section 16.
All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

SECTION 4: First aid measures

General information Get medical attention if any discomfort develops.

4.1. Description of first aid measures

Inhalation Move to fresh air. Get medical attention if any discomfort continues.

Skin contact Immediately remove contaminated clothing. Wash with soap and water. Continue to rinse for at least 15 minutes. Get medical attention if irritation develops or persists.

Eye contact Do not rub eyes. Remove any contact lenses. Flush eyes thoroughly with water, taking care to rinse under eyelids. If irritation persists, continue flushing for 15 minutes, rinsing from time to time under eyelids. If discomfort continues, consult a physician.

Ingestion Immediately rinse mouth and drink plenty of water. Do not induce vomiting. Get medical attention if irritation develops and persists.

4.2. Most important symptoms and effects, both acute and delayed Skin irritation. May cause eye irritation. Symptoms include itching, burning, redness, and tearing of eyes. Central nervous system depression.

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

SECTION 5: Firefighting measures

General fire hazards The product is not flammable.

5.1. Extinguishing media

Suitable extinguishing media Dry chemical, foam, water, sand.

Unsuitable extinguishing media No restrictions known.

5.2. Special hazards arising from the substance or mixture Combustion products include sulfur dioxide/sulfur oxides.

5.3. Advice for firefighters

Special protective equipment for firefighters Self-contained breathing apparatus, operated in positive pressure mode and full protective clothing must be worn in case of fire.

Special fire fighting procedures Move containers from fire area if you can do it without risk. Use water spray to cool unopened containers. Cool containers with flooding quantities of water until well after fire is out.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel Ensure adequate ventilation. Ventilate closed spaces before entering. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Wear protective clothing as described in section 8 of this safety data sheet.

For emergency responders Keep unnecessary personnel away. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Use personal protection as recommended in section 8 of the SDS.

6.2. Environmental precautions Prevent further leakage or spillage if safe to do so. Do not contaminate water.

6.3. Methods and material for containment and cleaning up	Clean up in accordance with all applicable regulations. Should not be released into the environment. Small Spills: Absorb spill with vermiculite or other inert material, then place in a container for chemical waste. Clean contaminated surface thoroughly. Large Spills: Prevent product from entering drains. Do not allow material to contaminate ground water system. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Ensure that waste and contaminated materials are collected and removed from the work area as soon as possible in a suitably labelled container.
6.4. Reference to other sections	For personal protection, see section 8 of the SDS. For waste disposal, see section 13 of the SDS.

SECTION 7: Handling and storage

7.1. Precautions for safe handling	Use only with adequate ventilation. Avoid inhalation of dust and contact with skin and eyes. Use work methods which minimise dust production. Wash thoroughly after handling. Risk of dust explosion: Ground container and transfer equipment to eliminate static electric sparks. Use Personal Protective Equipment recommended in section 8 of the SDS. Observe good industrial hygiene practices.
7.2. Conditions for safe storage, including any incompatibilities	Store in tightly closed original container in a dry, cool and well-ventilated place. Store away from incompatible materials. Keep container tightly closed and sealed until ready for use.
7.3. Specific end use(s)	For detailed information, see section 1.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits	No exposure limits noted for ingredient(s).
Biological limit values	No biological exposure limits noted for the ingredient(s).
Recommended monitoring procedures	Follow standard monitoring procedures.
Derived no effect levels (DNELs)	Not available.
Predicted no effect concentrations (PNECs)	Not available.

8.2. Exposure controls

Appropriate engineering controls	Provide adequate ventilation. Observe Occupational Exposure Limits and minimise the risk of inhalation of dust. If no exposure limits are stated, follow the recommended exposure limit of 10 mg/m3 for total nuisance dust. Use explosion-proof ventilation equipment.

Individual protection measures, such as personal protective equipment

General information	Use personal protective equipment as required. Personal protective equipment should be chosen according to the CEN standards and in discussion with the supplier of the personal protective equipment.
Eye/face protection	Wear goggles/face shield. Eye protection should meet standard EN 166.
Skin protection	
- Hand protection	Wear suitable gloves tested to EN374.
- Other	Wear suitable protective clothing.
Respiratory protection	In case of inadequate ventilation or risk of inhalation of dust, use suitable respiratory equipment with particle filter (type P2). Seek advice from local supervisor.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
Hygiene measures	Handle in accordance with good industrial hygiene and safety practices. Wash hands after handling. Routinely wash work clothing and protective equipment to remove contaminants. Observe any medical surveillance requirements.
Environmental exposure controls	Contain spills and prevent releases and observe national regulations on emissions.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	
Physical state	Solid.
Form	Solid.
Colour	Yellow.
Odour	Characteristic.
Odour threshold	Not available.

pH	Not available.
Melting point/freezing point	113 - 120 °C (235.4 - 248 °F)
Initial boiling point and boiling range	444.6 °C (832.28 °F)
Flash point	168.0 °C (334.4 °F) Closed cup
Evaporation rate	Not available.
Flammability (solid, gas)	Fine particles may form explosive mixtures with air.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Vapour pressure	Not applicable.
Vapour density	Not applicable.
Relative density	Not available.
Solubility(ies)	Not available.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Not available.
Explosive properties	Not explosive.
Oxidising properties	Not oxidising.
9.2. Other information	
Density	2.07 g/cm3 20 °C
Molecular formula	S
Molecular weight	32.06 g/mol

SECTION 10: Stability and reactivity

10.1. Reactivity	The product is non-reactive under normal conditions of use, storage and transport.
10.2. Chemical stability	Stable at normal conditions.
10.3. Possibility of hazardous reactions	Hazardous polymerisation does not occur.
10.4. Conditions to avoid	Moisture. Contact with incompatible materials.
10.5. Incompatible materials	Strong oxidising agents. Fluoride. Chlorine.
10.6. Hazardous decomposition products	No hazardous decomposition products are known.

SECTION 11: Toxicological information

General information	Occupational exposure to the substance or mixture may cause adverse effects.
Information on likely routes of exposure	
Inhalation	Inhalation of dusts may cause respiratory irritation.
Skin contact	Causes skin irritation.
Eye contact	Dust in the eyes will cause irritation.
Ingestion	May cause discomfort if swallowed.
Symptoms	Causes skin irritation. Symptoms include itching, burning, redness, and tearing of eyes. Central nervous system depression.

11.1. Information on toxicological effects

Acute toxicity

Product	Species	Test results
Sulphur (CAS 7704-34-9)		
Acute		
Dermal		
LD50	Rabbit	> 2000 mg/kg
Inhalation		
LC50	Rat	> 5.43 g/m3, 4 Hours

Product	Species	Test results
Oral		
LD50	Rat	> 2000 mg/kg

Skin corrosion/irritation	Causes skin irritation.
Serious eye damage/eye irritation	Based on available data, the classification criteria are not met.
Respiratory sensitisation	Based on available data, the classification criteria are not met.
Skin sensitisation	Based on available data, the classification criteria are not met.
Germ cell mutagenicity	Based on available data, the classification criteria are not met.
Carcinogenicity	Based on available data, the classification criteria are not met.
Reproductive toxicity	Based on available data, the classification criteria are not met.
Specific target organ toxicity - single exposure	Based on available data, the classification criteria are not met.
Specific target organ toxicity - repeated exposure	Based on available data, the classification criteria are not met.
Aspiration hazard	Not applicable.
Mixture versus substance information	Not available.
Other information	No other specific acute or chronic health impact noted.

SECTION 12: Ecological information

12.1. Toxicity	Based on available data, the classification criteria are not met for hazardous to the aquatic environment, acute hazard. Based on available data, the classification criteria are not met for hazardous to the aquatic environment, long term.
12.2. Persistence and degradability	The product is not biodegradable.
12.3. Bioaccumulative potential	The product is not bioaccumulating.
Partition coefficient n-octanol/water (log Kow)	Not available.
Bioconcentration factor (BCF)	Not available.
12.4. Mobility in soil	No data available.
Mobility in general	The product is insoluble or slightly soluble in water.
12.5. Results of PBT and vPvB assessment	Not a PBT or vPvB substance or mixture.
12.6. Other adverse effects	No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Residual waste	Dispose of in accordance with local regulations.
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied.
EU waste code	The Waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Disposal methods/information	Dispose in accordance with all applicable regulations.

SECTION 14: Transport information

ADR

14.1. - 14.6.: Not regulated as dangerous goods.

RID

14.1. - 14.6.: Not regulated as dangerous goods.

ADN

14.1. - 14.6.: Not regulated as dangerous goods.

IATA

14.1. - 14.6.: Not regulated as dangerous goods.

IMDG

14.1. - 14.6.: Not regulated as dangerous goods.

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code Not applicable.

SECTION 15: Regulatory information

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

EU regulations

Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex I and II, as amended

Not listed.

Regulation (EC) No. 850/2004 On persistent organic pollutants, Annex I as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 1 as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 2 as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 3 as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex V as amended

Not listed.

Regulation (EC) No. 166/2006 Annex II Pollutant Release and Transfer Registry, as amended

Not listed.

Regulation (EC) No. 1907/2006, REACH Article 59(10) Candidate List as currently published by ECHA

Not listed.

Authorisations

Regulation (EC) No. 1907/2006, REACH Annex XIV Substances subject to authorisation, as amended

Not listed.

Restrictions on use

Regulation (EC) No. 1907/2006, REACH Annex XVII Substances subject to restriction on marketing and use as amended

Not listed.

Directive 2004/37/EC: on the protection of workers from the risks related to exposure to carcinogens and mutagens at work, as amended.

Not listed.

Other EU regulations

Directive 2012/18/EU on major accident hazards involving dangerous substances, as amended

Not listed.

Other regulations The product is classified and labelled in accordance with Regulation (EC) 1272/2008 (CLP Regulation) as amended. This Safety Data Sheet complies with the requirements of Regulation (EC) No 1907/2006 as amended.

National regulations Follow national regulation for work with chemical agents.

15.2. Chemical safety assessment For this substance a chemical safety assessment has been carried out.

The identified/registered uses:
Use as a substance as intermediate.
Distribution of a substance.
Use as release agents or binders.
Rubber production and processing.
Use in agrochemicals.
Explosives manufacture & use.

SECTION 16: Other information

List of abbreviations

DNEL: Derived No-Effect Level.

PNEC: Predicted No-Effect Concentration.
PBT: Persistent, bioaccumulative and toxic.
vPvB: Very Persistent and very Bioaccumulative.
DSD: Directive 67/548/EEC.
CLP: Regulation No. 1272/2008.
LC50: Lethal Concentration, 50%.
LL50: Lethal level, 50%.
EL50: Effective level, 50%.

References	IUCLID Chemical safety report. IARC Monographs. Overall Evaluation of Carcinogenicity (Volumes 1-106)
Information on evaluation method leading to the classification of mixture	The classification for health and environmental hazards is derived by a combination of calculation methods and test data, if available.
Full text of any H-statements not written out in full under Sections 2 to 15	H315 Causes skin irritation.
Training information	Follow training instructions when handling this material.
Disclaimer	The information in the sheet was written based on the best knowledge and experience currently available at the date of revision and exclusively refer to the product in its as-delivered condition. The information and recommendations are offered for the user's consideration and examination. The logo and the name "LUKOIL oil company" may include anyone or more of LUKOIL Neftohim Burgas AD or LUKOIL or any affiliates in which they directly or indirectly hold any interest.

Annex to the extended Safety Data Sheet (eSDS)

Table of contents

1 - Exposure Scenario Worker

1. Manufacture of substance

List of use descriptors

Sector(s) of Use	SU3: Industrial uses SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals
Name of contributing environmental scenario and corresponding ERC	ERC1: Manufacture of the substance ERC4: Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
List of names of contributing worker scenarios and corresponding PROCs	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Chemical production where opportunity for exposure arises PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities PROC15: Use as laboratory reagent
Further explanations	
Other Process or activity	Manufacture of the substance or use as a process chemical or extraction agent. Includes recycling / recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).

2.1.1. Contributing scenario controlling environmental exposure for Manufacture of the substance

Product characteristics

Physical state	Solid.
Amounts used	
	Not applicable.
Frequency and duration of use	
Batch process	Not applicable.
Continuous process	Not applicable.

Environment factors not influenced by risk management

Local freshwater dilution factor:	Not applicable.
Local marine water dilution factor:	Not applicable.
Other factors	Not applicable.

Other given operational conditions affecting environmental exposure

Not applicable.

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	Not applicable.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Air	Not available.
Soil	Not available.
Water	Not available.
Sediment	Not available.
Remarks	Not available.
Organisational measures to prevent/limit release from site	Not available.

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/treatment plant (m3/d)

Type	Not applicable.
Discharge rate	Not applicable.

Treatment effectiveness	Not applicable.
Sludge treatment technique	Not applicable.
Measures to limit air emissions	Not applicable.

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

Suitable waste treatment	Not available.
Disposal methods	Not available.
Treatment effectiveness	Not applicable.
Remarks	Not available.

Conditions and measures related to external recovery of waste

Fraction of used amount transferred to external waste treatment

Suitable recover operations	Not available.
Treatment effectiveness	Not applicable.
Remarks	Not available.

Additional good practice advice beyond the REACH CSA	Not available.

2.2.1. Contributing scenario controlling worker exposure for Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Process categories beyond the REACH CSA	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 non dedicated-facilities Transfer of substance or mixture (charging/discharging) at dedicated facilities Use as laboratory reagent

Product characteristics

Concentration of the substance in a mixture	Covers percentage substance in the product up to 100 %.
Physical form of the product	Solid at STP, liquid at elevated operating temperature, vapour pressure < 0.5 kPa
vapour pressure	-
Process temperature	Operation is carried out at elevated temperature (> 20°C above ambient temperature)

Amounts used

Not applicable.

Frequency and duration of use

Covers daily exposures up to 8 hours

Human factors not influenced by risk management

Other given operational conditions affecting workers exposure

Assumes a good basic standard of occupational hygiene is implemented.

Other relevant operational conditions

Not available.

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	No other specific measures identified.
Technical conditions and measures to control dispersion from source towards the worker	No other specific measures identified.
Organizational measures to prevent/limit releases, dispersion and exposure	No other specific measures identified.

Conditions and measures related to personal protection, hygiene and health evaluations	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

3. Exposure Estimation

Environment

Not applicable.

Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

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

Environment

Not applicable.

Health

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk management measures are based on qualitative risk characterisation.
Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

2 - Exposure Scenario Worker

1. Use as an intermediate

List of use descriptors

Sector(s) of Use	SU3: Industrial uses SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals
Name of contributing environmental scenario and corresponding ERC	ERC6a: Use of intermediate
List of names of contributing worker scenarios and corresponding PROCs	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Chemical production where opportunity for exposure arises PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities PROC15: Use as laboratory reagent PROC22: Manufacturing and processing of minerals and/or metals at substantially elevated temperature PROC23: Open processing and transfer operations at substantially elevated temperature
Further explanations	
Other Process or activity	Use of substance as an intermediate. Includes recycling/recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).

2.1.1. Contributing scenario controlling environmental exposure for Use of intermediate

Product characteristics

Physical state	Solid.
Amounts used	
	Not applicable.
Frequency and duration of use	
Batch process	Not applicable.
Continuous process	Not applicable.

Environment factors not influenced by risk management

Local freshwater dilution factor:	Not applicable.
Local marine water dilution factor:	Not applicable.
Other factors	Not applicable.

Other given operational conditions affecting environmental exposure

Not applicable.

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	Not applicable.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Air	Not available.
Soil	Not available.
Water	Not available.
Sediment	Not available.
Remarks	Not available.
Organisational measures to prevent/limit release from site	Not available.

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/treatment plant (m3/d)

Type	Not applicable.
Discharge rate	Not applicable.
Treatment effectiveness	Not applicable.
Sludge treatment technique	Not applicable.
Measures to limit air emissions	Not applicable.

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

Suitable waste treatment	Not available.
Disposal methods	Not available.
Treatment effectiveness	Not applicable.
Remarks	Not available.

Conditions and measures related to external recovery of waste

Fraction of used amount transferred to external waste treatment

Suitable recover operations	Not available.
Treatment effectiveness	Not applicable.
Remarks	Not available.

Additional good practice advice beyond the REACH CSA	Not available.

2.2.1. Contributing scenario controlling worker exposure for Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Process categories beyond the REACH CSA	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 non dedicated-facilities Transfer of substance or mixture (charging/discharging) at dedicated facilities Use as laboratory reagent Manufacturing and processing of minerals and/or metals at substantially elevated temperature Open processing and transfer operations at substantially elevated temperature

Product characteristics

Concentration of the substance in a mixture	Covers percentage substance in the product up to 100 %.
Physical form of the product	Solid at STP, liquid at elevated operating temperature, vapour pressure < 0.5 kPa
vapour pressure	-
Process temperature	Operation is carried out at elevated temperature (> 20°C above ambient temperature)

Amounts used

Not applicable.

Frequency and duration of use

Covers daily exposures up to 8 hours

Human factors not influenced by risk management

Other given operational conditions affecting workers exposure

Assumes a good basic standard of occupational hygiene is implemented

Other relevant operational conditions

Not available.

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	No other specific measures identified.
Technical conditions and measures to control dispersion from source towards the worker	No other specific measures identified.

Organizational measures to prevent/limit releases, dispersion and exposure	No other specific measures identified.
Conditions and measures related to personal protection, hygiene and health evaluations	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

3. Exposure Estimation

Environment

Compartment	PEC	RCR (PEC/PNEC)	Method	Remarks

Not relevant.

Health

	Exposure level	RCR	Method	Remarks

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

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

Environment

Not applicable.

Health

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk management measures are based on qualitative risk characterisation.
Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

3 - Exposure Scenario Worker

1. Distribution of substance

List of use descriptors

Sector(s) of Use	SU3: Industrial uses
Name of contributing environmental scenario and corresponding ERC	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) ERC5: Use at industrial site leading to inclusion into/onto article ERC6a: Use of intermediate ERC6b: Use of reactive processing aid at industrial site (no inclusion into or onto article) Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article) ERC6d: Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article) ERC7: Use of functional fluid at industrial site
List of names of contributing worker scenarios and corresponding PROCs	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Chemical production where opportunity for exposure arises PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) PROC15: Use as laboratory reagent
Further explanations	
Other Process or activity	Bulk loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading, maintenance and associated laboratory activities.

2.1.1. Contributing scenario controlling environmental exposure for Manufacture of the substance

Product characteristics

Physical state	Solid.
Amounts used	
	Not applicable.
Frequency and duration of use	
Batch process	Not applicable.
Continuous process	Not applicable.

Environment factors not influenced by risk management

Local freshwater dilution factor:	Not applicable.
Local marine water dilution factor:	Not applicable.
Other factors	Not applicable.

Other given operational conditions affecting environmental exposure

Not applicable.

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	Not applicable.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Air	Not available.
Soil	Not available.
Water	Not available.
Sediment	Not available.
Remarks	Not available.

Organisational measures to prevent/limit release from site	Not available.

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/treatment plant (m3/d)

Type	Not applicable.
Discharge rate	Not applicable.
Treatment effectiveness	Not applicable.
Sludge treatment technique	Not applicable.
Measures to limit air emissions	Not applicable.

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

Suitable waste treatment	Not available.
Disposal methods	Not available.
Treatment effectiveness	Not applicable.
Remarks	Not available.

Conditions and measures related to external recovery of waste

Fraction of used amount transferred to external waste treatment

Suitable recover operations	Not available.
Treatment effectiveness	Not applicable.
Remarks	Not available.

Additional good practice advice beyond the REACH CSA	Not available.

2.2.1. Contributing scenario controlling worker exposure for Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Process categories beyond the REACH CSA	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 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) Use as laboratory reagent

Product characteristics

Concentration of the substance in a mixture	Covers percentage substance in the product up to 100 %.
Physical form of the product	Solid at STP, liquid at elevated operating temperature, vapour pressure < 0.5 kPa
vapour pressure	-
Process temperature	Operation is carried out at elevated temperature (> 20°C above ambient temperature)

Amounts used

Not applicable.

Frequency and duration of use

Covers daily exposures up to 8 hours

Human factors not influenced by risk management

Other given operational conditions affecting workers exposure

Assumes a good basic standard of occupational hygiene is implemented

Other relevant operational conditions

Not available.

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	No other specific measures identified.

Technical conditions and measures to control dispersion from source towards the worker	No other specific measures identified.
Organizational measures to prevent/limit releases, dispersion and exposure	No other specific measures identified.
Conditions and measures related to personal protection, hygiene and health evaluations	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

3. Exposure Estimation

Environment

Not available.

Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

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

Environment

Not applicable.

Health

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk management measures are based on qualitative risk characterisation.
Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4 - Exposure Scenario Worker

1. Formulation & (re)packing of substances and mixtures

List of use descriptors

Sector(s) of Use	SU3: Industrial uses SU10: Formulation [mixing] of preparations and/or re-packaging
Name of contributing environmental scenario and corresponding ERC	ERC2: Formulation into mixture
List of names of contributing worker scenarios and corresponding PROCs	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Chemical production where opportunity for exposure arises PROC5: Mixing or blending in batch processes PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) PROC14: Tabletting, compression, extrusion, pelettisation, granulation PROC15: Use as laboratory reagent PROC23: Open processing and transfer operations at substantially elevated temperature PROC24: High (mechanical) energy work-up of substances bound in/on materials and/or articles
Further explanations	
Other Process or activity	Bulk loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading, maintenance and associated laboratory activities.

2.1.1. Contributing scenario controlling environmental exposure for Formulation into mixture

Product characteristics

Physical state	Solid.
Amounts used	
	Not applicable.
Frequency and duration of use	
Batch process	Not applicable.
Continuous process	Not applicable.

Environment factors not influenced by risk management

Local freshwater dilution factor:	Not applicable.
Local marine water dilution factor:	Not applicable.
Other factors	Not applicable.

Other given operational conditions affecting environmental exposure

Not applicable.

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	Not applicable.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Air	Not available.
Soil	Not available.
Water	Not available.
Sediment	Not available.
Remarks	Not available.
Organisational measures to prevent/limit release from site	Not available.

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/treatment plant (m3/d)

Type	Not applicable.
Discharge rate	Not applicable.
Treatment effectiveness	Not applicable.
Sludge treatment technique	Not applicable.
Measures to limit air emissions	Not applicable.

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

Suitable waste treatment	Not available.
Disposal methods	Not available.
Treatment effectiveness	Not applicable.
Remarks	Not available.

Conditions and measures related to external recovery of waste

Fraction of used amount transferred to external waste treatment

Suitable recover operations	Not available.
Treatment effectiveness	Not applicable.
Remarks	Not available.

Additional good practice advice beyond the REACH CSA Not available.

2.2.1. Contributing scenario controlling worker exposure for Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Process categories beyond the REACH CSA

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
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
Open processing and transfer operations at substantially elevated temperature
High (mechanical) energy work-up of substances bound in/on materials and/or articles

Product characteristics

Concentration of the substance in a mixture	Covers percentage substance in the product up to 100 %.
Physical form of the product	Solid at STP, liquid at elevated operating temperature, vapour pressure < 0.5 kPa
vapour pressure	-
Process temperature	Operation is carried out at elevated temperature (> 20°C above ambient temperature)

Amounts used

Not applicable.

Frequency and duration of use

Covers daily exposures up to 8 hours

Human factors not influenced by risk management

Other given operational conditions affecting workers exposure

Assumes a good basic standard of occupational hygiene is implemented

Other relevant operational conditions

Not available.

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	No other specific measures identified.

Technical conditions and measures to control dispersion from source towards the worker	No other specific measures identified.
Organizational measures to prevent/limit releases, dispersion and exposure	No other specific measures identified.
Conditions and measures related to personal protection, hygiene and health evaluations	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

3. Exposure Estimation

Environment

Not applicable.

Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

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

Environment

Not applicable.

Health

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk management measures are based on qualitative risk characterisation.
Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

5 - Exposure Scenario Worker

1. Use in binder and release agents

List of use descriptors

Sector(s) of Use	SU3: Industrial uses
Name of contributing environmental scenario and corresponding ERC	ERC4: Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
List of names of contributing worker scenarios and corresponding PROCs	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Chemical production where opportunity for exposure arises PROC6: Calendering operations PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring PROC14: Tabletting, compression, extrusion, pelettisation, granulation
Further explanations	
Other Process or activity	Covers the use as binders and release agents including material transfers, mixing, application (including spraying and brushing) and handling of waste.

2.1.1. Contributing scenario controlling environmental exposure for Use of non-reactive processing aid at industrial site (no inclusion into or onto article)

Product characteristics

Physical state	Solid.

Amounts used

Not applicable.

Frequency and duration of use

Batch process	Not applicable.
Continuous process	Not applicable.

Environment factors not influenced by risk management

Local freshwater dilution factor:	Not applicable.
Local marine water dilution factor:	Not applicable.
Other factors	Not applicable.

Other given operational conditions affecting environmental exposure

Not applicable.

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	Not applicable.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Air	Not available.
Soil	Not available.
Water	Not available.
Sediment	Not available.
Remarks	Not available.
Organisational measures to prevent/limit release from site	Not available.

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/treatment plant (m3/d)

Type	Not applicable.

Discharge rate	Not applicable.
Treatment effectiveness	Not applicable.
Sludge treatment technique	Not applicable.
Measures to limit air emissions	Not applicable.

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

Suitable waste treatment	Not available.
Disposal methods	Not available.
Treatment effectiveness	Not applicable.
Remarks	Not available.

Conditions and measures related to external recovery of waste

Fraction of used amount transferred to external waste treatment

Suitable recover operations	Not available.
Treatment effectiveness	Not applicable.
Remarks	Not available.

Additional good practice advice beyond the REACH CSA Not available.

2.2.1. Contributing scenario controlling worker exposure for Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Process categories beyond the REACH CSA

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
Calendering operations
Transfer of substance or mixture (charging/discharging) at non dedicated-facilities
Transfer of substance or mixture (charging/discharging) at dedicated facilities
Roller application or brushing
Treatment of articles by dipping and pouring
Tabletting, compression, extrusion, pelettisation, granulation

Product characteristics

Concentration of the substance in a mixture	Covers percentage substance in the product up to 100 %.
Physical form of the product	Solid at STP, liquid at elevated operating temperature, vapour pressure < 0.5 kPa
vapour pressure	-
Process temperature	Operation is carried out at elevated temperature (> 20°C above ambient temperature)

Amounts used

Not applicable.

Frequency and duration of use

Covers daily exposures up to 8 hours

Human factors not influenced by risk management

Other given operational conditions affecting workers exposure

Assumes a good basic standard of occupational hygiene is implemented

Other relevant operational conditions

Not available.

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	No other specific measures identified.
Technical conditions and measures to control dispersion from source towards the worker	No other specific measures identified.

Organizational measures to prevent/limit releases, dispersion and exposure	No other specific measures identified.
Conditions and measures related to personal protection, hygiene and health evaluations	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.

3. Exposure Estimation

Environment

Not available.

Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

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

Environment

Not applicable.

Health

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk management measures are based on qualitative risk characterisation.
Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

6 - Exposure Scenario Worker

1. Use in agrochemicals

List of use descriptors

Sector(s) of Use	SU22: Professional uses
Name of contributing environmental scenario and corresponding ERC	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)
List of names of contributing worker scenarios and corresponding PROCs	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC4: Chemical production where opportunity for exposure arises PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities PROC11: Non-industrial spraying PROC13: Treatment of articles by dipping and pouring
Further explanations	
Other Process or activity	Use as an agrochemical excipient for application by manual or machine spraying, smokes and fogging; including equipment clean-downs and disposal.

2.1.1. Contributing scenario controlling environmental exposure for Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)

Product characteristics

Physical state	Solid.
Amounts used	
	Not applicable.
Frequency and duration of use	
Batch process	Not applicable.
Continuous process	Not applicable.

Environment factors not influenced by risk management

Local freshwater dilution factor:	Not applicable.
Local marine water dilution factor:	Not applicable.
Other factors	Not applicable.

Other given operational conditions affecting environmental exposure

Not applicable.

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	Not applicable.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Air	Not available.
Soil	Not available.
Water	Not available.
Sediment	Not available.
Remarks	Not available.
Organisational measures to prevent/limit release from site	Not available.

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/treatment plant (m3/d)

Type	Not applicable.
Discharge rate	Not applicable.
Treatment effectiveness	Not applicable.
Sludge treatment technique	Not applicable.

Measures to limit air emissions	Not applicable.

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

Suitable waste treatment	Not available.
Disposal methods	Not available.
Treatment effectiveness	Not applicable.
Remarks	Not available.

Conditions and measures related to external recovery of waste

Fraction of used amount transferred to external waste treatment

Suitable recover operations	Not available.
Treatment effectiveness	Not applicable.
Remarks	Not available.

Additional good practice advice beyond the REACH CSA	Not available.

2.2.1. Contributing scenario controlling worker exposure for Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Process categories beyond the REACH CSA	Chemical production where opportunity for exposure arises Transfer of substance or mixture (charging/discharging) at non dedicated-facilities Transfer of substance or mixture (charging/discharging) at dedicated facilities Non-industrial spraying Treatment of articles by dipping and pouring

Product characteristics

Concentration of the substance in a mixture	Covers percentage substance in the product up to 100 %.
Physical form of the product	Solid at STP, liquid at elevated operating temperature, vapour pressure < 0.5 kPa
vapour pressure	-
Process temperature	Operation is carried out at elevated temperature (> 20°C above ambient temperature)

Amounts used

Not applicable.

Frequency and duration of use

Covers daily exposures up to 8 hours

Human factors not influenced by risk management

Other given operational conditions affecting workers exposure

Assumes a good basic standard of occupational hygiene is implemented

Other relevant operational conditions

Not available.

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	No other specific measures identified.
Technical conditions and measures to control dispersion from source towards the worker	No other specific measures identified.
Organizational measures to prevent/limit releases, dispersion and exposure	No other specific measures identified.
Conditions and measures related to personal protection, hygiene and health evaluations	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.

3. Exposure Estimation

Environment

Not relevant.

Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

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

Environment

Not applicable.

Health

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk management measures are based on qualitative risk characterisation.
Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

7 - Exposure Scenario Consumer

1. Use in agrochemicals

List of use descriptors

Sector(s) of Use	SU21: Consumer uses
Name of contributing environmental scenario and corresponding ERC	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)
List of names of contributing consumer scenarios and corresponding PROCs	PC12: Fertilizers PC22: Lawn and Garden Preparations, including fertilizers. PC27: Plant protection products
Further explanations	
Other Process or activity	Covers the consumer use in agrochemicals in liquid and solid forms.

2.1.1. Contributing scenario controlling environmental exposure for Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)

Product characteristics

Physical state	Solid.
Amounts used	
	Not applicable.
Frequency and duration of use	
Batch process	Not applicable.
Continuous process	Not applicable.

Environment factors not influenced by risk management

Local freshwater dilution factor:	Not applicable.
Local marine water dilution factor:	Not applicable.
Other factors	Not applicable.

Other given operational conditions affecting environmental exposure

Not applicable.

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	Not applicable.

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/treatment plant (m3/d)

Type	Not applicable.
Discharge rate	Not applicable.
Treatment effectiveness	Not applicable.
Sludge treatment technique	Not applicable.
Measures to limit air emissions	Not applicable.

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

Suitable waste treatment	Not available.
Disposal methods	Not available.
Treatment effectiveness	Not applicable.
Remarks	Not available.

Conditions and measures related to external recovery of waste

Fraction of used amount transferred to external waste treatment

Suitable recover operations	Not available.
Treatment effectiveness	Not applicable.

Remarks	Not available.
Additional good practice advice beyond the REACH CSA	Not available.

2.2.1. Contributing exposure scenario controlling consumer exposure for Fertilizers

Process categories beyond the REACH CSA	Lawn and Garden Preparations, including fertilizers. Plant protection products
Product characteristics	
Concentration of the substance in a mixture	Covers percentage substance in the product up to 100 %. PC12, PC27: Covers concentrations up to 90% PC22: Products containing Sulfur in high percentages (assume 90%) are sold for acidification of soil, to treat certain plant diseases (e.g. scab on potatoes) and as worm-deterrent (http://www.progreen.co.uk/index.php?c=61&p=132).
Physical form of the product	Solid at STP, liquid at elevated operating temperature, vapour pressure < 0.5 kPa
vapour pressure	-
Process temperature	Assumes activities are at ambient temperature (unless stated differently).
Amounts used	
Covers use up to	37500 g Unless otherwise stated.
Covers skin contact area up to	6600 cm² Unless otherwise stated.
For each use event, covers use amounts up to	2500 g (PC12, PC27)
Covers skin contact area up to	857.5 cm² (PC12, PC27)
For each use event, assumes swallowed amount of	0.3 g (PC12, PC27)

Frequency and duration of use

	Duration	Frequency of use	Remarks
Unless otherwise stated.	<= 8	<= 4 times per day	(Duration unit = hour)
PC12, PC22, PC27	1	<= 1 days per year	events per day

Human factors not influenced by risk management

Other given operational conditions affecting consumer exposure

Area of use	Room size	Temperature	Ventilation rate	Remarks
Assumes a room volume of maximum	20 m³	Typical ventilation		Indoor use
PC12, PC22, PC27				Outdoor use

Other relevant operational conditions

Not available.

Risk management measures (RMM)

Conditions and measures related to information and behavioral advice to consumers

Not available.

Conditions and measures related to personal protection, hygiene and health evaluations	No specific risk management measure identified beyond those operational conditions stated.

3. Exposure Estimation

Environment

Not applicable.

Health

The ECETOC TRA tool has been used to estimate consumer exposures, consistent with the content of ECETOC report #107 and the chapter R15 of the IR&CSA TGD. Where exposure determinants differ to these source, then they are indicated.

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

Environment

Not applicable.

Health

Predicted exposures are not expected to exceed the applicable consumer reference values when the operational conditions/risk management measures given in section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

8 - Exposure Scenario Worker

1. Use in rubber production and processing

List of use descriptors

Sector(s) of Use	SU3: Industrial uses SU10: Formulation [mixing] of preparations and/or re-packaging SU11: Manufacture of rubber products
Name of contributing environmental scenario and corresponding ERC	ERC1: Manufacture of the substance ERC4: Use of non-reactive processing aid at industrial site (no inclusion into or onto article) ERC6d: Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article)
List of names of contributing worker scenarios and corresponding PROCs	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Chemical production where opportunity for exposure arises PROC5: Mixing or blending in batch processes PROC6: Calendering operations PROC7: Industrial spraying PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) PROC13: Treatment of articles by dipping and pouring PROC14: Tabletting, compression, extrusion, pelettisation, granulation PROC15: Use as laboratory reagent PROC21: Low energy manipulation and handling of substances bound in/on materials and/or articles

Further explanations

Other Process or activity	Manufacture of tyres and general rubber articles, including processing of raw (uncured) rubber, handling and mixing of rubber additives, calendaring, vulcanising, cooling and finishing as well as maintenance.

2.1.1. Contributing scenario controlling environmental exposure for Manufacture of the substance

Product characteristics

Physical state	Solid.

Amounts used

Not applicable.

Frequency and duration of use

Batch process	Not applicable.
Continuous process	Not applicable.

Environment factors not influenced by risk management

Local freshwater dilution factor:	Not applicable.
Local marine water dilution factor:	Not applicable.
Other factors	Not applicable.

Other given operational conditions affecting environmental exposure

Not applicable.

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	Not applicable.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Air	Not available.
Soil	Not available.
Water	Not available.
Sediment	Not available.

Remarks	Not available.
Organisational measures to prevent/limit release from site	Not available.

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/treatment plant (m3/d)

Type	Not applicable.
Discharge rate	Not applicable.
Treatment effectiveness	Not applicable.
Sludge treatment technique	Not applicable.
Measures to limit air emissions	Not applicable.

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

Suitable waste treatment	Not available.
Disposal methods	Not available.
Treatment effectiveness	Not applicable.
Remarks	Not available.

Conditions and measures related to external recovery of waste

Fraction of used amount transferred to external waste treatment

Suitable recover operations	Not available.
Treatment effectiveness	Not applicable.
Remarks	Not available.
Additional good practice advice beyond the REACH CSA	Not available.

2.2.1. Contributing scenario controlling worker exposure for Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Process categories beyond the REACH CSA	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 Mixing or blending in batch processes Calendering operations 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) 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

Product characteristics

Concentration of the substance in a mixture	Covers percentage substance in the product up to 100 %.
Physical form of the product	Solid at STP, liquid at elevated operating temperature, vapour pressure < 0.5 kPa
vapour pressure	-
Process temperature	Operation is carried out at elevated temperature (> 20°C above ambient temperature)

Amounts used

Not applicable.

Frequency and duration of use

Covers daily exposures up to 8 hours

Human factors not influenced by risk management

Other given operational conditions affecting workers exposure

Assumes a good basic standard of occupational hygiene is implemented

Other relevant operational conditions

Not available.

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	No other specific measures identified.
Technical conditions and measures to control dispersion from source towards the worker	No other specific measures identified.
Organizational measures to prevent/limit releases, dispersion and exposure	No other specific measures identified.
Conditions and measures related to personal protection, hygiene and health evaluations	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.

3. Exposure Estimation

Environment

Not applicable.

Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

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

Environment

Not applicable.

Health

Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. Risk management measures are based on qualitative risk characterisation.
Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

9 - Exposure Scenario Worker

1. Use in explosives

List of use descriptors

Sector(s) of Use	SU22: Professional uses
Name of contributing environmental scenario and corresponding ERC	ERC8e: Widespread use of reactive processing aid (no inclusion into or onto article, outdoor)
List of names of contributing worker scenarios and corresponding PROCs	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions 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/discharging) at non dedicated-facilities PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities
Further explanations	
Other Process or activity	Covers exposures arising from the manufacture and use of slurry explosives (including materials transfer, mixing and charging) and equipment cleaning.

2.1.1. Contributing scenario controlling environmental exposure for Widespread use of reactive processing aid (no inclusion into or onto article, outdoor)

Product characteristics

Physical state	Solid.
Amounts used	
	Not applicable.
Frequency and duration of use	
Batch process	Not applicable.
Continuous process	Not applicable.

Environment factors not influenced by risk management

Local freshwater dilution factor:	Not applicable.
Local marine water dilution factor:	Not applicable.
Other factors	Not applicable.

Other given operational conditions affecting environmental exposure

Not applicable.

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	Not applicable.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Air	Not available.
Soil	Not available.
Water	Not available.
Sediment	Not available.
Remarks	Not available.
Organisational measures to prevent/limit release from site	Not available.

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/treatment plant (m3/d)

Type	Not applicable.
Discharge rate	Not applicable.
Treatment effectiveness	Not applicable.
Sludge treatment technique	Not applicable.

Measures to limit air emissions	Not applicable.

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

Suitable waste treatment	Not available.
Disposal methods	Not available.
Treatment effectiveness	Not applicable.
Remarks	Not available.

Conditions and measures related to external recovery of waste

Fraction of used amount transferred to external waste treatment

Suitable recover operations	Not available.
Treatment effectiveness	Not applicable.
Remarks	Not available.

Additional good practice advice beyond the REACH CSA	Not available.

2.2.1. Contributing scenario controlling worker exposure for Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Process categories beyond the REACH CSA	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

Product characteristics

Concentration of the substance in a mixture	Covers percentage substance in the product up to 100 %.
Physical form of the product	Solid at STP, liquid at elevated operating temperature, vapour pressure < 0.5 kPa
vapour pressure	-
Process temperature	Operation is carried out at elevated temperature (> 20°C above ambient temperature)

Amounts used

Not applicable.

Frequency and duration of use

Covers daily exposures up to 8 hours

Human factors not influenced by risk management

Other given operational conditions affecting workers exposure

Assumes a good basic standard of occupational hygiene is implemented

Other relevant operational conditions

Not available.

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	No other specific measures identified.
Technical conditions and measures to control dispersion from source towards the worker	No other specific measures identified.
Organizational measures to prevent/limit releases, dispersion and exposure	No other specific measures identified.
Conditions and measures related to personal protection, hygiene and health evaluations	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

3. Exposure Estimation

Environment

Not applicable.

Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

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

Environment

Not applicable.

Health

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk management measures are based on qualitative risk characterisation.
Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.