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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.

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

Identified uses Industrial, professional and consumer use.
 A complete list of registered uses for this product can be found in the table of content of the exposure scenario for communication, available as an annex to the 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.)

Toxicology Information Service + 34 91 562 04 20 (Available 24 hours a day. SDS/Product information may not be available for the Emergency Service.)

3E Emergency Services +1-760-476-3961 (Access code: 333368): Emergency and incident response number is provided by 3E, available 24 hours a day, 7 days a week.

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.

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 information on the label

None.

2.3. Other hazards

This substance does not meet vPvB / PBT criteria of Regulation (EC) No 1907/2006, Annex XIII. The substance is not included in the list established in accordance with REACH Article 59(1) for having endocrine disrupting properties. The substance is not considered to have endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605.

SECTION 3: Composition/information on ingredients

3.1. Substances

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 them. 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 Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. Fume scrubbers, filters or engineering modifications to the process equipment may be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state Solid.
Form Solid.
Colour Yellow.
Odour Characteristic.
Melting point/freezing point > 113 - < 120 °C (> 235,4 - < 248 °F)
Boiling point or initial boiling point and boiling range 444,6 °C (832,28 °F)
Flammability Fine particles may form explosive mixtures with air.
Upper/lower flammability or explosive limits
Explosive limit - lower (%) Not applicable.
Explosive limit – upper (%) Not applicable.
Flash point 168 °C (334,4 °F) Closed cup
Auto-ignition temperature Not determined.
Decomposition temperature Not determined.
pH Not applicable.
Kinematic viscosity Not applicable.
Kinematic viscosity temperature Not applicable.
Solubility
Solubility (water) Insoluble in water.
Partition coefficient (n-octanol/water) (log value) Not applicable.
Vapour pressure Not applicable.
Density and/or relative density
Density 2,07 g/cm³ (20 °C (68 °F))
Vapour density Not applicable.
Particle characteristics Not determined.

9.2. Other information

9.2.1. Information with regard to physical hazard classes No relevant additional information available.

9.2.2. Other safety characteristics

Molecular formula S
Molecular weight 32,06 g/mol
Specific gravity > 1,8002 - < 2,6
2,0702

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 hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity

Product	Species	Test Results
Sulphur (CAS 7704-34-9)		
Acute Dermal		
LD50	Rabbit	> 2000 mg/kg
Inhalation		
LC50	Rat	> 5,43 g/m ³ , 4 Hours
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	No information available.

11.2. Information on other hazards

Endocrine disrupting properties	This substance does not have endocrine disrupting properties with respect to human health, as it does not meet the assessment criteria laid out in Regulations (EC) No 1907/2006, (EU) No 2017/2100 and (EU) 2018/605.
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 K_{ow})	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	This substance does not meet vPvB / PBT criteria of Regulation (EC) No 1907/2006, Annex XIII.
12.6. Endocrine disrupting properties	This substance does not have endocrine disrupting properties with respect to the environment, as it does not meet the assessment criteria laid out in Regulations (EC) No 1907/2006, (EU) No 2017/2100 and (EU) 2018/605.
12.7. Other adverse effects	No data available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Residual waste	Dispose 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. UN number	Not regulated as dangerous goods.
14.2. UN proper shipping name	Not regulated as dangerous goods.
14.3. Transport hazard class(es)	
Class	Not assigned.
Subsidiary risk	-
Hazard No. (ADR)	Not assigned.
Tunnel restriction code	Not assigned.
14.4. Packing group	Not assigned.
14.5. Environmental hazards	No.
14.6. Special precautions for user	Not assigned.

RID

14.1. UN number	Not regulated as dangerous goods.
14.2. UN proper shipping name	Not regulated as dangerous goods.
14.3. Transport hazard class(es)	
Class	Not assigned.
Subsidiary risk	-
14.4. Packing group	Not assigned.
14.5. Environmental hazards	No.
14.6. Special precautions for user	Not assigned.

ADN

14.1. UN number	Not regulated as dangerous goods.
14.2. UN proper shipping name	Not regulated as dangerous goods.
14.3. Transport hazard class(es)	
Class	Not assigned.
Subsidiary risk	-
14.4. Packing group	Not assigned.
14.5. Environmental hazards	No.
14.6. Special precautions for user	Not assigned.

IATA

14.1. UN number	Not regulated as dangerous goods.
14.2. UN proper shipping name	Not regulated as dangerous goods.
14.3. Transport hazard class(es)	
Class	Not assigned.
Subsidiary risk	-
14.4. Packing group	Not assigned.
14.5. Environmental hazards	No.
14.6. Special precautions for user	Not assigned.

IMDG

14.1. UN number	Not regulated as dangerous goods.
14.2. UN proper shipping name	Not regulated as dangerous goods.
14.3. Transport hazard class(es)	
Class	Not assigned.
Subsidiary risk	-
14.4. Packing group	Not assigned.

14.5. Environmental hazards

Marine pollutant No.

EmS Not assigned.

14.6. Special precautions for user Not assigned.

14.7. Maritime transport in bulk according to IMO instruments 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 (EU) 2019/1021 On persistent organic pollutants (recast), 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 authorization, 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.

SECTION 16: Other information

List of abbreviations

PBT: Persistent, bioaccumulative and toxic.

vPvB: Very Persistent and very Bioaccumulative.

LC50: Lethal Concentration, 50%.

LL50: Lethal level, 50%.

EL50: Effective level, 50%.

CEN: European Committee for Standardization (Comité Européen de Normalisation).

References

Chemical safety report.

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 statements,
which are 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)

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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.

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.

Treatment effectiveness Not applicable.

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.

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

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.

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.
Treatment effectiveness	Not applicable.

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.

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

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
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Not relevant.

Health

Exposure level	RCR	Method	Remarks
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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)
ERC6c: 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.

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.
Treatment effectiveness Not applicable.

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.

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

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: Tableting, 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.

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.
Treatment effectiveness	Not applicable.

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.

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

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: Tableting, 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.
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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.
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Amounts used

Not applicable.

Frequency and duration of use

Batch process	Not applicable.
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Continuous process	Not applicable.
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Environment factors not influenced by risk management

Local freshwater dilution factor:	Not applicable.
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Local marine water dilution factor:	Not applicable.
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Other factors	Not applicable.
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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.
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Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Air	Not available.
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Soil	Not available.
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Water	Not available.
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Sediment	Not available.
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Organisational measures to prevent/limit release from site	Not available.
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Conditions and measures related to municipal sewage treatment plant

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

Type	Not applicable.
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Discharge rate	Not applicable.
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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.
Treatment effectiveness	Not applicable.

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.

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

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.

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.
Treatment effectiveness	Not applicable.

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.

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

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 of 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.

Treatment effectiveness Not applicable.

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.

2.2.1. Contributing exposure scenario controlling consumer exposure for Fertilizers

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 cm ² Unless otherwise stated.
For each use event, covers use amounts up to	2500 g (PC12, PC27)
Covers skin contact area up to	857,5 cm ² (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 m ³	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: Calendaring 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: Tableting, 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.

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.

Treatment effectiveness Not applicable.

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.

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

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.

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.
Treatment effectiveness	Not applicable.

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.

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

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.