MICRONIZED SULPHUR ANIMAL FEED

SAFETY DATA SHEET

According to Regulation (EU) No. 2015/830

Date of issue: 27/06/2018 Revision date: 27/06/2018 Supersedes: --- Version: 1.0

SECTION 1. IDENTIFICATIÓN OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

Product form: Mixture

Trade name: MICRONIZED SULPHUR ANIMAL FEED

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

1.2.1. Relevant identified uses

Main use category: Professional use

Use of the substance/mixture: Industrial use.

1.2.2. Uses advised against

No additional information available.

1.3. Details of the supplier of the safety data sheet

AZUFRERA Y FERTILIZANTES PALLARES, S.A.

Av. Europa parcela 1 – 7 (Polígono Industrial Constanti)

43120 CONSTANTI – TARRAGONA - SPAIN

TEL: + 34 977 524 650 FAX: + 34 977 524 651

afepasa@afepasa.com - www.afepasa.com

1.4. Emergency telephone number

Emergency number: +34 977 524 650 (Monday to Friday from 08.00 to 17.00)

SECTION 2. HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

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

Skin irrit. 2 H315

Full text of H-statements: see section 16

2.2 Label elements

Labeling according to Regulation (EC) Nº 1272/2008 (CLP)

Hazard pictograms (CLP)

GHS07

Signal word (CLP): Warning

Hazard statements (CLP): H315: Causes skin irritation

Precautionary statements (CLP): P261: Avoid breathing dust
P264: Wash hands, forearms and face thoroughly after handling
P280: Wear protective gloves
P302+352: IF ON SKIN: Wash with plenty of water and soap.

EUH statements: EUH401 – To avoid risks to human health and the environment; comply with the instructions for use.

Extra phrases: Wash all protective clothing after use
Do not contaminate water with the product or its container

2.3. Other hazards

This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII

This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Sustance

Not applicable

3.2. Mixture

Name	Product Identifier	%	Classification according to Regulation (EC) No. 1272/2008
Sulfur	CAS № 7704-34-9 EC № # 231-722-6 EC Index № 016-094-00-1 REACH № 01-2119487295-27	99-100	Skin irrit. 2, H315

Full text of H-phrases, see section 16

SECTION 4. FIRST AID MEASURES

4.1. Description of first aid measures

First-aid measures general	Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).
First-aid measures after inhalation	Remove person to fresh air and keep comfortable for breathing. If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. Give oxygen or artificial respiration as needed.
First-aid measures after skin contact	Remove affected clothing and wash all exposed skin area with mild soap and water, followed by warm water rinse. Wash contaminated clothing before reuse. If skin irritation occurs: Get medical advice/attention.
First-aid measures after eye contact	Rinse immediately with plenty of water. Ensure adequate flushing of eyes by separating eyelids with the fingers. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if pain, blinking or redness persist.
First-aid measures after ingestion	Rinse mouth. Do NOT induce vomiting. Obtain emergency medical attention. Give water to drink if victim completely conscious/alert. If vomiting occurs, keep the affected person inclined in order to avoid the vomit entering to the airways.

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

Symptoms/injuries after skin contact: Causes skin irritation

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

When contacting a physician, take this SDS with you.

SECTION 5. FIREFIGHTING MEASURES

5.1. Extinguishing media

Suitable extinguishing media: Foam. Dry powder. Carbon dioxide. Water spray.

Unsuitable extinguishing media: do not use jet streams

5.2. Special hazards arising from the substance or mixture

Hazardous decomposition products in case of fire: Sulphur oxides. Hydrogen sulphur.

5.3. Advice for firefighters

Firefighting instructions:

Evacuate area. Use spray water or fog for cooling exposed containers. Exercise caution when fighting any Chemical fire. Prevent fire-fighting water from entering environment.

Protection during firefighting:

Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures.

6.1.1. For non-emergency personnel

Evacuate unnecessary personnel.

6.1.2. For emergency personnel

Protective equipment:

Equip cleanup crew with proper protection. Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "·Exposure controls/personal protection".

Emergency procedures:

Ventilate area. Remove ignition sources.

6.2. Environmental precautions

Avoid release to the environment. Prevent entry to sewers and public waters. Notify authorities if product enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up:
On land, sweep or shovel into suitable containers. Minimize generation of dust. Store away from other materials.

6.4. Reference to other sections

See Heading 8. Exposure controls/personal protection

SECTION 7. HANDLING AND STORAGE

7.1. Precautions for safe handling

Additional hazards when processed:	Avoid dust production.
Precautions for safe handling:	Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Provide good ventilation in process area to prevent formation of vapour. Wear protective equipment. Avoid contact with skin, eyes and clothing. Keep away from sources of ignition – No smoking.
Hygiene measures:	Wash hands and forearms thoroughly after handling.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions:	Keep only in the original container in a cool, well ventilated place away from: moisture, sources of ignition, strong oxidizing agents. Keep container closed when not in use.
Incompatible products:	Oxidizing agents, strong bases.
Incompatible materials:	Sources of ignition, direct sunlight.

7.3. Specific end uses

No additional information available.

SECCTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Sulphur (7704-34-9)	
PNEC (Oral)	
PNEC oral (secondary poisoning)	0,22 mg/l

8.2. Exposure controls

Appropriate engineering controls:	Provide local exhaust or general room ventilation to minimize exposure to dust. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure
Personal protective equipment:	Avoid all unnecessary exposure
Materials for protective clothing:	Wear suitable coveralls to prevent exposure to skin
Hand protection:	Protective gloves
Eye protection:	Chemical goggles or safety glasses
Skin and body protection:	Wear suitable protective clothing
Respiratory protection:	Wear appropriate mask. Dust mask with particle filter.

Other information: Do not eat, drink or smoke during use.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Physical state	Solid
Color	Yellow
Odor	Characteristic
Odor threshold	No data available
Ph	6.75 at 20ºC
Relative evaporation rate (butyl acetate =1)	No data available
Melting point	No data available
Freezing point	No data available
Boiling point	No data available
Flash point	No data available
Auto-ignition temperature	221ºC EEC MT A.16
Decomposition temperature	No data available
Flammability (solid, gas)	Not flammable (EEC MT A10)
Vapor pressure	No data available
Vapor density	No data available
Relative density	Not applicable
Solubility	Insoluble in water
Log Pow	No data available
Viscosity, kinematic	No data available
Viscosity, dynamic	134,1 mPa.s
Explosive properties	Not explosive (EEC MT A14)
Oxidizing properties	Not oxidizing (EEC MT A17)
Explosive limits	No data available

9.2. Additional information

Miscibility	The product is not soluble in water
Bulk density	0,84 compacted (CIPAC MT 33)
Other properties	Content S: 99,5%. Moisture: 0,20%

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 under normal conditions

10.3. Possibility of hazardous reactions

No polymerization. No dangerous reactions known under normal conditions of use. Sulfur is a strong reducing agent and it may generate explosions in contact with oxidizing agents. Acid gasses, like sulphur dioxide or sulphur steam mist, may be produced during sulphur combustion in the absence of oxygen.

10.4. Conditions to avoid

Direct sunlight. Extremely high of low temperatures. No flames, no sparks. Eliminate all sources of ignition.

10.5. Incompatible materials

Oxidising agents. Strong bases. Strong acids.

10.6. Hazardous decomposition products

Sulphur oxides. Hydrogen sulphide. Combustion produces toxic gases.

SECTION 11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Acute toxicity: Not classified

Sulphur (7704-34-9)	
LD50 oral	>2000 mg/kg
LD50 dermal rat	>2000 mg/kg
LC50 inhalation rat (dust/mist– mg/l/4h)	5,43 mg/l/4h

Skin corrosion/irritation : Causes skin irritation
Serious eye damage/irritation : Not classified
Respiratory or skin sensitisation: Not classified
Germ cell mutagenicity: Not classified
Carcinogenicity: Not classified
Reproductive toxicity: Not classified
Specific target organ toxicity (single exposure) Not classified

Sulphur (7704-34-9)	
NOAEL, subchronic, oral, rat	1000 mg/kg (90 days)
NOAEL, subacute, dermal, rat	400 mg/kg (28 days)

Specific target organ toxicity (repeated exposure) Not classified.
Aspiration hazard: Not classified
Potential adverse human health effects and symptoms Based on the available data, the classification criteria are not met

SECTION 12. ECOLOGICAL INFORMATION

12.1. Toxicity

Sulphur (7704-34-9)	
LC50 fish	< 14 ppm
EC50 Daphnia	> 5000 ppm

12.2. Persistence and degradability

Micronized sulphur 99,5%	
Persistence and degradability	Not established. Once sulfur is released into the environment, it is rapidly oxidized by bacteria, other microorganisms or spontaneously by the presence of oxygen, to become organic sulfur compounds. Sulfur is incorporated to the food chain by the action of the microorganisms present in water and soil, through oxidation and reduction reactions allowing the assimilation of these compounds by higher plants and animals.
Sulphur (7704-34-9)	
Persistence and degradability	Not established

12.3 Bioaccumulative potential

Micronized sulphur 99,5%	
Bioaccumulative potential	Not established
Sulphur (7704-34-9)	
Bioaccumulative potential	Not established

12.4. Mobility in soil

Micronized sulphur 99,5%	
Ecology - soil	Sulfur has, generally, a lifecycle and mobility similar to nitrogen´s, characteristic of those nutrients essential for cellular life development. It is not solubilized in water.

12.5. Results of PBT and vPvB assessment

Micronized sulphur 99,5%
This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII
This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

12.6. Other adverse effects

Additional information: Avoid release into the environment

SECTION 13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Waste disposal recommendations: Dispose in a safe manner in accordance with local/national regulations. Dispose of contents/container to hazardous or special waste collection point.

Additional information: The use of incinerators is not recommended due to the occurrence of SO_2 during the combustion, toxic to human and environment.

Ecology- waste materials: Avoid release into the environment

SECTION 14. TRANSPORT INFORMATION

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

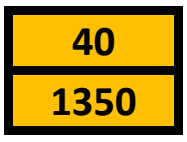
ADR	IMDG	IATA	ADN	RID
14.1. UN number				
1350	1350	1350	1350	1350
14.2. UN proper shipping name				
SULPHUR	SULPHUR	SULPHUR	SULPHUR	SULPHUR
Transport document description				
UN 1350 AZUFRE 4.1, III (E)	UN 1350 AZUFRE 4.1, III (E)			
14.3. Transport hazard class(es)				
4.1	4.1	4.1	4.1	4.1
				
14.4. Packing group				
III	III	III	III	III
14.5. Environmental hazards				
Dangerous for the environment: NO	Dangerous for the environment: NO Marine pollutant: NO	Dangerous for the environment: NO	Dangerous for the environment: NO	Dangerous for the environment: NO
No supplementary information available				

14.6. Special precautions for user

- Overland transport

Classification code (ADR):	F3
Special provisions (ADR):	242
Limited quantities (ADR):	5 kg
Excepted quantities (ADR):	E1
Packing instructions (ADR):	P002, IBC08, LP02, R001
Special packing instructions (ADR):	B3
Mixed packing instructions (ARD)	MP11
Potable tanks and bulk container instructions (ADR)	T1, BK1, BK2
Portable tank and bulk container special provisions (ADR):	TP33
Tank code (ADR):	SGAV
Vehicle for tank carriage:	AT
Transport category (ADR):	3
Special provisions for carriage – bulk (ADR)	VV1
Hazard identification number (Kemler No.):	40

Orange plates:



Tunnel restriction code (ADR):	E
EAC code:	1Z
- Transport by sea	
Special provisions (IMDG):	242, 967
Limited quantities (IMDG):	5 kg
Excepted quantities (IMDG):	E1
Packing instructions (IMDG):	P002, LP02
IBC packing instructions (IMDG):	IBC08
IBC special provisions (IMDG):	B3
Tank instructions (IMDG):	T1, BK2, BK3
Tank special dispositions (IMDG):	TP33
EmS-No (Fire):	F-A
EmS-No. (Spillage):	S-G
Stowage category (IMDG):	A
MF AG-No.:	133
- Air transport	
PCA Excepted quantities (IATA):	E1
PCA Limited quantities (IATA):	Y443
PCA limited quantity max net quantity (IATA):	10 kg
PCA Packing instructions (IATA):	446
PCA Max net quantity (IATA):	25kg
CAO packing instructions (IATA):	449
CAO max net quantity (IATA):	100 kg
Special provisions (IATA)	A105
ERG Code (IATA):	3L

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

No applicable

SECTION 15. REGULATORY INFORMATION

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

15.1.1. EU Regulations

The following restrictions are applicable according to Annex XVII of the REACH Regulation (EC) Nº 1907/2006 :

3.b. Substances or mixtures fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) nº 1272/2008: Hazard classes 3.1. to 3.6, 3.7 adverse effects on sexual function and fertility or on development, 3.8 effects other than narcotic effects, 3.9 and 3.10	MICRONIZED SULPHUR 99,5% - sulphur

Contains no substance on the REACH candidate list. Contains no REACH Annex XIV substances

15.1.2. National regulations

No additional information available

15.2. Chemical safety assessment

No chemical safety assessment has been carried out

For the following substances of this mixture a chemical safety assessment has been carried out
Sulphur

SECTION 16. OTHER INFORMATION

Data sources: REGULATION (EC) Nº 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008 on classification, labeling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC and amending Regulation (CE) Nº 1907/2006.

Other information: None

Full text of H- and EUH-phrases:

Skin irrit. 2	Skin corrosion/irritation, Category 2
H315	Causes skin irritation
EUH401	To avoid risk to human health and the environment, comply with the instructions of use

Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 (CLP):

Skin irrit. 2	H315	Calculation method

SDS EU (REACH Annex II)

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

SECTION 17. EXPOSURE SCENARIO

1. Use of Sulfur as Intermediate; industrial

Section 1 Exposure Scenario Title: Sulfur	
Title	
Manufacture of Substance	
Use Descriptor	
Sector(s) of Use	3,8,9
Process Categories	1, 2, 3, 4, 8a, 8b, 15, 22, 23 *Further information on the mapping and allocation of PROC codes is contained in Table 9.1*
Environmental Release Categories	6a
Specific Environmental Release Category	ESVOC SpERC 6.1a.v1
Processes, tasks, activities covered	
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).	
Assessment Method	
See Section 3.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure <0.5 kPa. OC29
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently). G13
Amount used	Not applicable
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently). G2
Human factors not influenced by risk management	Not applicable
Other Operational Conditions affecting exposure	Operation is carried out at elevated temperature (> 20°C above ambient temperature). OC7. Assumes a good basic standard of occupational hygiene is implemented. G1
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions**
General measures (skin irritants) G19	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. E3
CS15 General exposures (closed systems)	No other specific measures identified. EI20
CS15 General exposures (closed systems) CS56 With sample collection	No other specific measures identified. EI20
CS15 General exposures (closed systems) CS55 Batch process CS56 With sample collection	No other specific measures identified. EI20
CS2 Process sampling	No other specific measures identified. EI20
CS16 General exposures (open systems)	No other specific measures identified. EI20
CS36 Laboratory activities	No other specific measures identified. EI20
CS14 Bulk transfers CS81Dedicated facility	No other specific measures identified. EI20
CS39 Equipment Cleaning and Maintenance	No other specific measures identified. EI20
CS85 Bulk product storage	No other specific measures identified. EI20
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 1 to 2	
Section 2.2 Control of environmental exposure	
Not applicable	
Section 3 Exposure Estimation	
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.	
3.2. Environment	
Not applicable	

Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Risk Management Measures are based on qualitative risk characterisation. G37. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Users are advised to consider national Occupational Exposure Limits or other equivalent values. G38 Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23.
4.2. Environment
Not applicable

2. Use of Sulfur as Release Agents or Blinders; industrial

Section 1 Exposure Scenario Title: Sulfur	
Title	
Use as Release Agents or Binders	
Use Descriptor	
Sector(s) of Use	3
Process Categories	1, 2, 3, 4, 6, 8a, 8b, 10, 13, 14 *Further information on the mapping and allocation of PROC codes is contained in Table 9.1*
Environmental Release Categories	4
Specific Environmental Release Category	ESVOC SpERC 4.10a.v1
Processes, tasks, activities covered	
Covers the use as binders and release agents including material transfers, mixing, and application by spraying, brushing and handling of waste.	
Assessment Method	
See Section 3	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure <0.5 kPa. OC29
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently). G13
Amount used	Not applicable
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently). G2
Human factors not influenced by risk management	Not applicable
Other Operational Conditions affecting exposure	Operation is carried out at elevated temperature (> 20°C above ambient temperature). OC7. Assumes a good basic standard of occupational hygiene is implemented. G1
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions**
General measures (skin irritants) G19	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. E3. 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. E4.
CS15 General exposures (closed systems)	No other specific measures identified. EI20
CS15 General exposures (closed systems) CS56 With sample collection	No other specific measures identified. EI20
CS15 General exposures (closed systems) CS55 Batch process	No other specific measures identified. EI20
CS56 With sample collection	
CS16 General exposures (open systems)	No other specific measures identified. EI20
CS30 Mixing operations (open systems)	No other specific measures identified. EI20
CS98 Roller, spreader, flow application	No other specific measures identified. EI20
CS4 Dipping, immersion and pouring	No other specific measures identified. EI20
CS130 Article formation in mould	No other specific measures identified. EI20
CS14 Bulk transfers CS81 Dedicated facility	No other specific measures identified. EI20
CS39 Equipment Cleaning and Maintenance	No other specific measures identified. EI20
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 1 to 2	
Section 2.2 Control of environmental exposure	
Not applicable	
Section 3 Exposure Estimation	

3.1. Health
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.
3.2. Environment
Not applicable
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Risk Management Measures are based on qualitative risk characterisation. G37. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Users are advised to consider national Occupational Exposure Limits or other equivalent values. G38 Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23.
4.2. Environment
Not applicable

3. Use of Sulfur as Release Agents or Blinders; professional

Section 1 Exposure Scenario Title: Sulfur	
Title	
Use as Release Agents or Binders	
Use Descriptor	
Sector(s) of Use	22
Process Categories	1, 2, 3, 4, 6, 8a, 8b, 10, 13, 14 *Further information on the mapping and allocation of PROC codes is contained in Table 9.1*
Environmental Release Categories	8a, 8d
Specific Environmental Release Category	ESVOC SpERC 8.10b.v1
Processes, tasks, activities covered	
Covers the use as binders and release agents including material transfers, mixing, and application by spraying, brushing and handling of waste.	
Assessment Method	
See Section 3	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure <0.5 kPa. OC29
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently). G13
Amount used	Not applicable
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently). G2
Human factors not influenced by risk management	Not applicable
Other Operational Conditions affecting exposure	Operation is carried out at elevated temperature (> 20°C above ambient temperature). OC7. Assumes a good basic standard of occupational hygiene is implemented. G1
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions**
General measures (skin irritants) G19	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. E3. 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. E4.
CS15 General exposures (closed systems)	No other specific measures identified. EI20
CS15 General exposures (closed systems) CS56 With sample collection	No other specific measures identified. EI20
CS15 General exposures (closed systems) CS55 Batch process	No other specific measures identified. EI20
CS56 With sample collection	
CS16 General exposures (open systems)	No other specific measures identified. EI20
CS30 Mixing operations (open systems)	No other specific measures identified. EI20
CS98 Roller, spreader, flow application	No other specific measures identified. EI20
CS4 Dipping, immersion and pouring	No other specific measures identified. EI20
CS130 Article formation in mould	No other specific measures identified. EI20
CS14 Bulk transfers CS81 Dedicated facility	No other specific measures identified. EI20
CS39 Equipment Cleaning and Maintenance	No other specific measures identified. EI20
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 1 to 2	
Section 2.2 Control of environmental exposure	
Not applicable	
Section 3 Exposure Estimation	

3.1. Health
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.
3.2. Environment
Not applicable
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Risk Management Measures are based on qualitative risk characterisation. G37. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Users are advised to consider national Occupational Exposure Limits or other equivalent values. G38 Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23.
4.2. Environment
Not applicable

4. Manufacture of Sulfur; industrial

Section 1 Exposure Scenario Title: Sulfur	
Title	
Manufacture of Substance	
Use Descriptor	
Sector(s) of Use	3, 8, 9
Process Categories	1,2,3,4,8a,8b,15 *Further information on the mapping and allocation of PROC codes is contained in Table 9.1*
Environmental Release Categories	1,4
Specific Environmental Release Category	ESVOC SpERC 1.1.v1
Processes, tasks, activities covered	
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).	
Assessment Method	
See Section 3	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure <0.5 kPa. OC29
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently). G13
Amount used	Not applicable
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently). G2
Human factors not influenced by risk management	Not applicable
Other Operational Conditions affecting exposure	Operation is carried out at elevated temperature (> 20°C above ambient temperature). OC7. Assumes a good basic standard of occupational hygiene is implemented. G1
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions**
General measures (skin irritants) G19	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. E3
CS15 General exposures (closed systems)	No other specific measures identified. EI20
CS15 General exposures (closed systems) CS56 With sample collection	No other specific measures identified. EI20
CS15 General exposures (closed systems) CS55 Batch process CS56 With sample collection	No other specific measures identified. EI20
CS2 Process sampling	No other specific measures identified. EI20
CS16 General exposures (open systems)	No other specific measures identified. EI20
CS36 Laboratory activities	No other specific measures identified. EI20
CS14 Bulk transfers CS81Dedicated facility	No other specific measures identified. EI20
CS39 Equipment Cleaning and Maintenance	No other specific measures identified. EI20
CS85 Bulk product storage	No other specific measures identified. EI20
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 1 to 2	
Section 2.2 Control of environmental exposure	
Not applicable	
Section 3 Exposure Estimation	
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.	
3.2. Environment	
Not applicable	

Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Risk Management Measures are based on qualitative risk characterisation. G37. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Users are advised to consider national Occupational Exposure Limits or other equivalent values. G38 Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23.
4.2. Environment
Not applicable

5. Distribution of Sulfur; industrial

Section 1 Exposure Scenario Title: Sulfur	
Title	
Distribution of Substance	
Use Descriptor	
Sector(s) of Use	3
Process Categories	1, 2, 3, 4, 8a, 8b, 9, 15 *Further information on the mapping and allocation of PROC codes is contained in Table 9.1*
Environmental Release Categories	1, 2, 3, 4, 5, 6a, 6b, 6c, 6d, 7
Specific Environmental Release Category	ESVOC SpERC 1.1b.v1
Processes, tasks, activities covered	
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.	
Assessment Method	
See Section 3.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure <0.5 kPa. OC29
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently). G13
Amount used	Not applicable
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently). G2
Human factors not influenced by risk management	Not applicable
Other Operational Conditions affecting exposure	Operation is carried out at elevated temperature (> 20°C above ambient temperature). OC7. Assumes a good basic standard of occupational hygiene is implemented. G1
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions**
General measures (skin irritants) G19	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. E3
CS15 General exposures (closed systems)	No other specific measures identified. EI20
CS15 General exposures (closed systems) CS56 With sample collection	No other specific measures identified. EI20
CS15 General exposures (closed systems) CS55 Batch process CS56 With sample collection	No other specific measures identified. EI20
CS2 Process sampling	No other specific measures identified. EI20
CS16 General exposures (open systems)	No other specific measures identified. EI20
CS36 Laboratory activities	No other specific measures identified. EI20
CS14 Bulk transfers CS81Dedicated facility	No other specific measures identified. EI20
CS39 Equipment Cleaning and Maintenance	No other specific measures identified. EI20
CS85 Bulk product storage	No other specific measures identified. EI20
CS7 Small package filling	No other specific measures identified. EI20
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 1 to 2	
Section 2.2 Control of environmental exposure	
Not applicable	
Section 3 Exposure Estimation	
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.	
3.2. Environment	
Not applicable	

Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Risk Management Measures are based on qualitative risk characterisation. G37. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Users are advised to consider national Occupational Exposure Limits or other equivalent values. G38 Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23.
4.2. Environment
Not applicable

6. Formulation & (Re)packing of Sulfur; industrial

Section 1 Exposure Scenario Title: Sulfur	
Title	
Formulation & (Re)packing of Substances and Mixtures	
Use Descriptor	
Sector(s) of Use	3,10
Process Categories	1, 2, 3, 4, 5, 8a, 8b, 9, 14, 15, 23, 24 *Further information on the mapping and allocation of PROC codes is contained in Table 9.1*
Environmental Release Categories	2
Specific Environmental Release Category	ESVOC SpERC 2.2.v1
Processes, tasks, activities covered	
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.	
Assessment Method	
See Section 3.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure <0.5 kPa. OC29
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently). G13
Amount used	Not applicable
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently). G2
Human factors not influenced by risk management	Not applicable
Other Operational Conditions affecting exposure	Operation is carried out at elevated temperature (> 20°C above ambient temperature). OC7. Assumes a good basic standard of occupational hygiene is implemented. G1
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions**
General measures (skin irritants) G19	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. E3
CS15 General exposures (closed systems)	No other specific measures identified. EI20
CS15 General exposures (closed systems) CS56 With sample collection	No other specific measures identified. EI20
CS15 General exposures (closed systems) CS55 Batch process CS56 With sample collection	No other specific measures identified. EI20
CS2 Process sampling	No other specific measures identified. EI20
CS16 General exposures (open systems)	No other specific measures identified. EI20
CS30 Mixing operations (open systems)	No other specific measures identified. EI20
CS512 Milling, grinding and similar activities	No other specific measures identified. EI20
CS7 Small package filling	No other specific measures identified. EI20
CS 53 Pelletising	No other specific measures identified. EI20
CS36 Laboratory activities	No other specific measures identified. EI20
CS14 Bulk transfers CS81 Dedicated facility	No other specific measures identified. EI20
CS39 Equipment Cleaning and Maintenance	No other specific measures identified. EI20
CS16 General exposures (open systems) CS111 elevated temperature	No other specific measures identified. EI20
CS85 Bulk product storage	No other specific measures identified. EI20
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 1 to 2	
Section 2.2 Control of environmental exposure	
Not applicable	
Section 3 Exposure Estimation	

3.1. Health
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.
3.2. Environment
Not applicable
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Risk Management Measures are based on qualitative risk characterisation. G37. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Users are advised to consider national Occupational Exposure Limits or other equivalent values. G38 Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23.
4.2. Environment
Not applicable

7. Use of Sulfur in Agrochemicals; professional

Section 1 Exposure Scenario Title: Sulfur	
Title	
Uses in Agrochemicals	
Use Descriptor	
Sector(s) of Use	22
Process Categories	1, 4, 8a, 8b, 11, 13 *Further information on the mapping and allocation of PROC codes is contained in Table 9.1*
Environmental Release Categories	8a,8b
Specific Environmental Release Category	ESVOC SpERC 8.11a.v1
Processes, tasks, activities covered	
Use as an agrochemical excipient for application by manual or machine spraying, smokes and fogging; including equipment clean-downs and disposal.	
Assessment Method	
See Section 3.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure <0.5 kPa. OC29
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently). G13
Amount used	Not applicable
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently). G2
Human factors not influenced by risk management	Not applicable
Other Operational Conditions affecting exposure	Operation is carried out at elevated temperature (> 20°C above ambient temperature). OC7. Assumes a good basic standard of occupational hygiene is implemented. G1
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions**
General measures (skin irritants) G19	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. E3. 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. E4.
CS15 General exposures (closed systems)	No other specific measures identified. EI20
CS16 General exposures (open systems)	No other specific measures identified. EI20
CS14 Bulk transfers CS81 Dedicated facility	No other specific measures identified. EI20
CS10 Spraying	No other specific measures identified. EI20
CS4 Dipping, immersion and pouring	No other specific measures identified. EI20
CS39 Equipment Cleaning and Maintenance	No other specific measures identified. EI20
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 1 to 2	
Section 2.2 Control of environmental exposure	
Not applicable	
Section 3 Exposure Estimation	
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.	
3.2. Environment	
Not applicable	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1. Health	
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Risk Management Measures are based on qualitative risk characterisation. G37.	

Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Users are advised to consider national Occupational Exposure Limits or other equivalent values. G38 Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23.
4.2. Environment
Not applicable

8. Uses of Sulfur in Agrochemicals; consumer

Section 1 Exposure Scenario Title: Sulfur			
Title			
Use in Agrochemicals			
Use Descriptor			
Sector(s) of Use	22		
Product Categories	12,22,27 *Further information on the mapping and allocation of PC codes is contained in Table 1.*		
Environmental Release Categories	8a,8d		
Specific Environmental Release Category	ESVOC SpERC 8.11b.v1		
Processes, tasks, activities covered			
Covers the consumer use in agrochemicals in liquid and solid forms.			
Assessment Method			
See Section 3.			
Section 2 Operational conditions and risk management measures			
Section 2.1 Control of worker exposure			
Product characteristics			
Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure <0.5 kPa. OC29		
Concentration of substance in product	Unless otherwise stated, cover concentrations up to 100%. [ConsOC1].		
Amounts used	Unless otherwise stated, covers use amounts up to37500g. [ConsOC2]. ; covers skin contact area up to 6600cm2. [ConsOC5].		
Frequency and duration of use/exposure	Unless otherwise stated, covers use frequency up to 4 times per day [ConsOC4]. ; covers exposure up to 8 hours per event. [ConsOC14].		
Other Operational Conditions affecting exposure	Unless otherwise stated assumes use at ambient temperatures. [ConsOC15]. ; assumes use in a 20 m^3 room. [ConsOC11]. ; assumes use with typical ventilation. [ConsOC8].		
Product Category	**Specific Risk Management Measures and Operating Conditions**		
PC12:Fertilizers	OC	Unless otherwise stated, covers concentrations up to 90%. [ConsOC1]. ; covers use up to 1 days/year[ConsOC3]. ; covers use up to 1 time/on day of use[ConsOC4]. ; covers skin contact area up to 857.50 cm^2. [ConsOC5]. ; for each use event, assumes swallowed amount of 0.3g [ConsOC13]. ; for each use event, covers use amounts up to 2500g. [ConsOC2]. ; covers outdoor use. [ConsOC12].	
	RMM	No specific RMMs identified beyond those OCs stated	
PC22: Lawn and garden preparations, including fertilizers	OC	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. The products are provided as prill (pellets) in bags of 1 kg. Recommended application frequency is of the order of once per year. The exposure assessment is conducted using the <0.1 Pa band values of the ESIG consumer assessment tool (Appendix 1.c).	
	RMM	No specific RMMs identified beyond those OCs stated	
PC27_n: Plant protection products	OC	Unless otherwise stated, covers concentrations up to 90%. [ConsOC1]. ; covers use up to 1 days/year[ConsOC3]. ; covers use up to 1 time/on day of use[ConsOC4]. ; covers skin contact area up to 857.50 cm^2. [ConsOC5]. ; for each use event, assumes swallowed amount of 0.3g [ConsOC13]. ; for each use event, covers use amounts up to 2500g. [ConsOC2]. ; covers outdoor use. [ConsOC12]	
	RMM	No specific RMMs identified beyond those OCs stated	
In ***Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 1 to 2***			
Section 2.2 Control of environmental exposure			
Not applicable			
Section 3 Exposure Estimation			
3.1. 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 sources, then they are indicated. G42			

3.2. Environment
Not applicable
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. 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. G39. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23.
4.2. Environment
Not applicable

9. Use of Sulfur in Road and Construction Applications; professional

Section 1 Exposure Scenario Title: Sulfur	
Title	
Use in Road and Construction Applications	
Use Descriptor	
Sector(s) of Use	22
Process Categories	8a,8b,9,10,11,13 *Further information on the mapping and allocation of PROC codes is contained in Table 9.1*
Environmental Release Categories	8d,8f
Specific Environmental Release Category	ESVOC SpERC 8.15.v1
Processes, tasks, activities covered	
Application of surface coatings and binders in road and construction activities, including paving uses, manual mastic and in the application of roofing and water-proofing membranes.	
Assessment Method	
See Section 3.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure <0.5 kPa. OC29
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently). G13
Amount used	Not applicable
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently). G2
Human factors not influenced by risk management	Not applicable
Other Operational Conditions affecting exposure	Operation is carried out at elevated temperature (> 20°C above ambient temperature). OC7. Assumes a good basic standard of occupational hygiene is implemented. G1
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions**
General measures (skin irritants) G19	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. E3. 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. E4.
CS14 Bulk transfers CS81 Dedicated facility	No other specific measures identified. EI20
CS7 Small package filling	No other specific measures identified. EI20
CS98 Roller, spreader, flow application	No other specific measures identified. EI20
CS10 Spraying	No other specific measures identified. EI20
CS4 Dipping, immersion and pouring	No other specific measures identified. EI20
CS39 Equipment Cleaning and Maintenance	No other specific measures identified. EI20
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 1 to 2	
Section 2.2 Control of environmental exposure	
Not applicable	
Section 3 Exposure Estimation	
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.	
3.2. Environment	
Not applicable	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1. Health	
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Risk Management Measures are based on	

qualitative risk characterisation. G37. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Users are advised to consider national Occupational Exposure Limits or other equivalent values. G38 Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23.
4.2. Environment
Not applicable

10. Use of Sulfur in Rubber Production and Processing; industrial

Section 1 Exposure Scenario Title: Sulfur	
Title	
Rubber Production and Processing	
Use Descriptor	
Sector(s) of Use	3,10,11
Process Categories	1,2,3,4,5,6,7,8a,8b,9,13,14,15,21 *Further information on the mapping and allocation of PROC codes is contained in Table 9.1*
Environmental Release Categories	1,4,6d
Specific Environmental Release Category	ESVOC SpERC 4.19.v1
Processes, tasks, activities covered	
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.	
Assessment Method	
See Section 3.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure <0.5 kPa. OC29
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently). G13
Amount used	Not applicable
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently). G2
Human factors not influenced by risk management	Not applicable
Other Operational Conditions affecting exposure	Operation is carried out at elevated temperature (> 20°C above ambient temperature). OC7. Assumes a good basic standard of occupational hygiene is implemented. G1
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions**
General measures (skin irritants) G19	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. E3. 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. E4.
CS15 General exposures (closed systems)	No other specific measures identified. EI20
CS15 General exposures (closed systems) CS56 With sample collection	No other specific measures identified. EI20
CS15 General exposures (closed systems) CS55 Batch process CS56 With sample collection	No other specific measures identified. EI20
CS16 General exposures (open systems)	No other specific measures identified. EI20
CS30 Mixing operations (open systems)	No other specific measures identified. EI20
CS64 Calendering (including Banburys) CS70 Vulcanisation CS71 Cooling cured articles	No other specific measures identified. EI20
CS10 Spraying	No other specific measures identified. EI20
CS90 Small scale weighing	No other specific measures identified. EI20
CS4 Dipping, immersion and pouring	No other specific measures identified. EI20
CS73 Pressing uncured rubber blanks	No other specific measures identified. EI20
CS102 Finishing operations	No other specific measures identified. EI20
CS36 Laboratory activities	No other specific measures identified. EI20
CS14 Bulk transfers CS81 Dedicated facility	No other specific measures identified. EI20
CS39 Equipment Cleaning and Maintenance	No other specific measures identified. EI20

Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 1 to 2
Section 2.2 Control of environmental exposure
Not applicable
Section 3 Exposure Estimation
3.1. Health
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.
3.2. Environment
Not applicable
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Risk Management Measures are based on qualitative risk characterisation. G37. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Users are advised to consider national Occupational Exposure Limits or other equivalent values. G38 Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23.
4.2. Environment
Not applicable

11. Use of Sulfur as a Fuel; industrial

Section 1 Exposure Scenario Title: Sulfur	
Title	
Use as a Fuel	
Use Descriptor	
Sector(s) of Use	3
Process Categories	1,2,3,4,8a,8b,16 *Further information on the mapping and allocation of PROC codes is contained in Table 9.1*
Environmental Release Categories	7
Specific Environmental Release Category	ESVOC SpERC 7.12a.v1
Processes, tasks, activities covered	
Covers the use as a fuel (or fuel additives and additive components) and includes activities associated with its transfer, use, equipment maintenance and handling of waste..	
Assessment Method	
See Section 3.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure <0.5 kPa. OC29
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently). G13
Amount used	Not applicable
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently). G2
Human factors not influenced by risk management	Not applicable
Other Operational Conditions affecting exposure	Operation is carried out at elevated temperature (> 20°C above ambient temperature). OC7. Assumes a good basic standard of occupational hygiene is implemented. G1
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions**
General measures (skin irritants) G19	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. E3
CS15 General exposures (closed systems)	No other specific measures identified. EI20
CS15 General exposures (closed systems) CS56 With sample collection	No other specific measures identified. EI20
CS15 General exposures (closed systems) CS55 Batch process CS56 With sample collection	No other specific measures identified. EI20
CS2 Process sampling	No other specific measures identified. EI20
CS16 General exposures (open systems)	No other specific measures identified. EI20
CS 107 (closed system)	No other specific measures identified. EI20
CS14 Bulk transfers CS81 Dedicated facility	No other specific measures identified. EI20
CS39 Equipment Cleaning and Maintenance	No other specific measures identified. EI20
CS85 Bulk product storage	No other specific measures identified. EI20
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 1 to 2	
Section 2.2 Control of environmental exposure	
Not applicable	
Section 3 Exposure Estimation	
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.	
3.2. Environment	
Not applicable	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1. Health	

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Risk Management Measures are based on qualitative risk characterisation. G37. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Users are advised to consider national Occupational Exposure Limits or other equivalent values. G38 Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23.
4.2. Environment
Not applicable

12. Use of Sulfur in Explosives Manufacture and Use; professional

Section 1 Exposure Scenario Title: Sulfur	
Title	
Explosives Manufacture and Use	
Use Descriptor	
Sector(s) of Use	22
Process Categories	1,3,5,8a,8b *Further information on the mapping and allocation of PROC codes is contained in Table 9.1*
Environmental Release Categories	8e
Specific Environmental Release Category	*Not Applicable*
Processes, tasks, activities covered	
Covers exposures arising from the manufacture and use of slurry explosives (including materials transfer, mixing and charging) and equipment cleaning	
Assessment Method	
See Section 3.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure <0.5 kPa. OC29
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently). G13
Amount used	Not applicable
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently). G2
Human factors not influenced by risk management	Not applicable
Other Operational Conditions affecting exposure	Operation is carried out at elevated temperature (> 20°C above ambient temperature). OC7. Assumes a good basic standard of occupational hygiene is implemented. G1
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions**
General measures (skin irritants) G19	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. E3
CS15 General exposures (closed systems)	No other specific measures identified. EI20
CS15 General exposures (closed systems) CS55 Batch process CS56 With sample collection	No other specific measures identified. EI20
CS30 Mixing operations (open systems)	No other specific measures identified. EI20
CS14 Bulk transfers CS81 Dedicated facility	No other specific measures identified. EI20
CS39 Equipment Cleaning and Maintenance	No other specific measures identified. EI20
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 1 to 2	
Section 2.2 Control of environmental exposure	
Not applicable	
Section 3 Exposure Estimation	
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.	
3.2. Environment	
Not applicable	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1. Health	
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Risk Management Measures are based on qualitative risk characterisation. G37. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Users are advised to consider national Occupational Exposure Limits or other equivalent values. G38	

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23.
4.2. Environment
Not applicable

13. Use of sulfur in Matches; consumer

Basic data for the assessments:
Sulfur is classified for skin irritation effects (R38). There are no DNELs set for inhalation, dermal or oral route. A reference value of >5000 mg/kg, representing a "guide LD_{50}" was used in modeling. Specific gravity of Sulfur considered for this assessment is 2,07 g/cm^3. The Vapour Pressure considered for this assessment was 2.65E-20Pa@115.36°C

13.1. Human Health Exposure Scenario / Estimation for Use of Sulfur in Matches (PC 11; ERC 8e; ERC Defined release fractions):
Matches contain approximately 4% S. During intended use (lighting of a match) the S burns instantly and there is no exposure to Sulfur. Matches are considered a common household good. In line with REACH guidance (Chapter R.15) the only scenario requiring further analysis is an infant mouthing (not swallowing) a match. The calculation assumes a match head with radius of 3 mm, a layer of 0,01 cm removed by mouthing and a Sulfur content of 4%. Infant body weight is 7.62 kg (RIVM 320104002). The resulting dose is 0.12 mg/kg.

13.2. Environment Exposure Scenario / Estimation for Use of Sulfur in Matches (PC 11; ERC 8e; ERC Defined release fractions):
Not applicable

14. Use of sulfur in Fireworks; consumer

14.1. Environment Exposure Scenario / Estimation for Use of Sulfur in Matches (PC 11; ERC 8e; ERC Defined release fractions):
During intended use (explosion of fireworks) the Sulfur burns instantly and there is no exposure to Sulfur. Fireworks are not considered a common household good, hence infants are not expected to encounter mouthing opportunities. No exposure calculation is performed.

14.2. Environment Exposure Scenario / Estimation for Use of Sulfur in Fireworks (PC 11; ERC 8e; ERC Defined release fractions):
Not applicable