Potassium sulphate

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

1.1. Product identifier

Trade name/designation:

Potassium sulphate

Other means of identification:

Dipotassium sulfate

CAS No.:
7778-80-5

REACH No.:
01-2119489441-34-0037

EC No.:
231-915-5

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

Use of the substance/mixture:

Intermediate (precursor), Fertilizers
For reasons of clarity and comprehensibility the following section contains only the most important identified uses. For additional uses please consult the manufacturer or the the trading company.

Relevant identified uses:

	Sector of uses [SU]
SU 3:	Industrial uses: Uses of substances as such or in preparations at industrial sites
SU 8:	Manufacture of bulk, large scale chemicals (including petroleum products)
SU 21:	Consumer uses
SU 22:	Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
	Product Categories [PC]
PC 0:	Other
PC 12:	Fertilizers
PC 27:	Plant protection products
	Process categories [PROC]
PROC 1:	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC 3:	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC 4:	Chemical production where opportunity for exposure arises
PROC 5:	Mixing or blending in batch processes
PROC 6:	Calendering operations
PROC 7:	Industrial spraying
PROC 8a:	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC 8b:	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC 9:	Transfer of substance or mixture into small containers (dedicated filling line, including weighing)
PROC 10:	Roller application or brushing
PROC 11:	Non industrial spraying
PROC 13:	Treatment of articles by dipping and pouring
PROC 14:	Tabletting, compression, extrusion, pelletisation, granulation
PROC 15:	Use as laboratory reagent
PROC 21:	Low energy manipulation of substances bound in materials and/or articles
PROC 24:	High (mechanical) energy work-up of substances bound in/on materials and/or articles
PROC 26:	Handling of solid inorganic substances at ambient temperature

Potassium sulphate

Environmental release categories [ERC]

ERC 1: Manufacture of the substance
ERC 2: Formulation into mixture (mixtures)
ERC 3: Formulation in materials
ERC 4: Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ERC 5: Use at industrial site leading to inclusion into/onto article
ERC 6a: Use of intermediate
ERC 8a: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC 8b: Widespread use of reactive processing aid (no inclusion into or onto article, indoor)
ERC 8c: Widespread use leading to inclusion into/onto article (indoor)
ERC 8d: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
ERC 8e: Widespread use of reactive processing aid (no inclusion into or onto article, outdoor)
ERC 10b: Widespread use of articles with high or intended release (outdoor)
ERC 11b: Widespread use of articles with high or intended release (indoor)
ERC 12b: Processing of articles at industrial sites with high release

1.3. Details of the supplier of the safety data sheet

Supplier (manufacturer/importer/only representative/downstream user/distributor):

Mercuria Biofuels Brunsbüttel GmbH & Co. KG
Fährstr. 51
25541 Brunsbüttel
Germany
Telephone: +49 4852 836 8035
Telefax: +49 4852 836 8003
E-mail: fwerner@mercuria.com

E-mail (competent person): fwerner@mercuria.com

1.4. Emergency telephone number

GIZ Nord, 24h: +49 (5 51) 1 92 40

Company: Laboratory Manager, +49 4852 836 8035 (Only available during office hours.)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

No data available

2.2. Label elements

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

According to EC directives or the corresponding national regulations the product does not have to be labelled.

Precautionary statements Prevention	
P280	Wear protective gloves/protective clothing/eye protection/face protection.

Precautionary statements Response	
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313	If eye irritation persists: Get medical advice/attention.

2.3. Other hazards

Adverse physicochemical effects:

No

Potassium sulphate

SECTION 3: Composition/information on ingredients

3.1. Substances

Hazardous ingredients / Hazardous impurities / Stabilisers:

Product identifiers	Substance name Classification according to Regulation (EC) No 1272/2008 [CLP]	Concentration
CAS No.: 7778-80-5 EC No.: 231-915-5 REACH No.: 01-2119489441-34-XXXX	**potassium sulfate** The substance is classified as not hazardous according to regulation (EC) No 1272/2008 [CLP].	> 85 – < 95 weight-%
	Organic substances of vegetable origin The substance is classified as not hazardous according to regulation (EC) No 1272/2008 [CLP].	> 3.5 – < 8 weight-%
CAS No.: 7732-18-5 EC No.: 231-791-2	**water** The substance is classified as not hazardous according to regulation (EC) No 1272/2008 [CLP].	> 1 – < 2.5 weight-%
CAS No.: 7646-93-7 EC No.: 231-594-1 Index No.: 016-056-00-4	**potassium hydrogensulphate** STOT SE 3 (H335), Skin Corr. 1B (H314)  Danger	> 0.5 – < 0.95 weight-%

Full text of H- and EUH-phrases: see section 16.

SECTION 4: First aid measures

4.1. Description of first aid measures

Following inhalation:

If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.
If breathing is irregular or stopped, administer artificial respiration.
No mouth-to-mouth or mouth-to-nose resuscitation. Use Ambu bag or ventilator.

In case of skin contact:

After contact with skin, wash immediately with plenty of water and soap.

After eye contact:

After contact with the eyes, rinse with water with the eyelids open for a sufficient length of time, then consult an ophthalmologist immediately.

Following ingestion:

In case of accident or unwellness, seek medical advice immediately (show directions for use or safety data sheet if possible).
Rinse mouth immediately and drink plenty of water.
Induce vomiting when the affected person is not unconscious.
Never give anything by mouth to an unconscious person or a person with cramps.

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

Acute effects: Causes serious eye irritation.
Delayed effects: --

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

No data available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media:

D-powder Carbon dioxide (CO_2) Foam Water mist

Unsuitable extinguishing media:

--

5.2. Special hazards arising from the substance or mixture

In case of fire may be liberated: Sulphur dioxide (SO_2)

5.3. Advice for firefighters

Wear a self-contained breathing apparatus and chemical protective clothing.

Potassium sulphate

Use of protective clothing

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Personal precautions:
Avoid dust formation.
Avoid contact with skin, eyes and clothes.
Avoid dust formation.

Protective equipment:
Wear breathing apparatus if exposed to vapours/dusts/aerosols.

6.1.2. For emergency responders

Personal protection equipment:
In case of fire: Wear self-contained breathing apparatus.

6.2. Environmental precautions

Do not allow to enter into surface water or drains.
Knock down dust with water spray jet.

6.3. Methods and material for containment and cleaning up

For cleaning up:
Collect in closed and suitable containers for disposal.
Wash with plenty of water.
To clean the floor and all objects contaminated by this material, use plenty of water.
IF ON CLOTHING: rinse immediately contaminated clothing and skin with plenty of water before removing clothes.

6.4. Reference to other sections

=> 8. Personal protection equipment
=> 13. Waste treatment methods

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Protective measures

Advices on safe handling:
Provide adequate ventilation as well as local exhaustion at critical locations. Use suitable protective equipment. Avoid contact with skin, eyes and clothes. Avoid dust formation.

When using do not eat, drink or smoke. Wash hands thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace.

Measures to prevent aerosol and dust generation:
Carry out filling operations only at stations with exhaust ventilation facilities.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures and storage conditions:
Store in a cool dry place.

Packaging materials:
plastic , Steel

Requirements for storage rooms and vessels:
Keep/Store only in original container. Keep container tightly closed.

Storage class (TRGS 510, Germany): 13 – Non-combustible solids that cannot be assigned to any of the above storage classes

7.3. Specific end use(s)

No data available

Potassium sulphate

SECTION 8: Exposure controls/personal protection

8.1. Control parameters
No data available

8.2. Exposure controls

8.2.1. Appropriate engineering controls
Provide adequate ventilation as well as local exhaustion at critical locations.

8.2.2. Personal protection equipment

Eye/face protection:
Suitable eye protection: Wear eye/face protection.

Skin protection:
Hand protection: NBR (Nitrile rubber)

Respiratory protection:
dust formation: Suitable respiratory protection apparatus: P1

Other protection measures:
Protective clothing: Wear suitable protective clothing. Boots
General health and safety measures: Wash hands and face before breaks and after work and take a shower if necessary.

8.2.3. Environmental exposure controls
No data available

8.3. Additional information
To date, no national critical limit values exist.

Recommended occupational and consumer exposure limit values

Exposure pattern | DNEL workers
Oral n.a.
Dermal 21.3 mg/kg bw/d
Inhalation 37.6 mg/m³

Exposure pattern | DNEL General population
Oral 12.8 mg/kg bw/d
Dermal 12.8 mg/kg bw/d
Inhalation 11.1 mg/m³

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance
Physical state: solid: crystalline
Colour: colourless , white
Odour: --

Safety relevant basis data

Parameter	Value	at °C	① Method ② Remark
pH	6 – 7	25 °C	② Dissolved substance quantity: 120 g/l
Melting point	≈ 1,067 °C		
Freezing point	*not applicable*		
Initial boiling point and boiling range	≈ 1,689 °C		
Flash point	*not applicable*		
Evaporation rate	*not applicable*		

Potassium sulphate

Parameter	Value	at °C	① Method ② Remark
Auto-ignition temperature	*not applicable*		
Upper/lower flammability or explosive limits	*not applicable*		
Vapour pressure	*not applicable*		
Vapour density	*not applicable*		
Density	≈ 2.66 g/cm³	20 °C	
Water solubility	≈ 120 g/L	25 °C	
Partition coefficient: n-octanol/water	*not applicable*		
Dynamic viscosity	*not applicable*		
Kinematic viscosity	*not applicable*		

9.2. Other information

Non-flammable.
Not oxidising.
Not explosive.

SECTION 10: Stability and reactivity

10.1. Reactivity

Substance is stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

10.2. Chemical stability

Substance is stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

10.3. Possibility of hazardous reactions

When heated to decomposition temperature, it emits toxic fumes of K2O and SOx.
Danger of explosion: sodium, magnesium

10.4. Conditions to avoid

Keep away from sources of heat (e.g. hot surfaces), sparks and open flames.

10.5. Incompatible materials

No data available

10.6. Hazardous decomposition products

In case of fire may be liberated: Gases/vapours, harmful Sulphur oxides

SECTION 11: Toxicological information

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

Acute oral toxicity:

Acute toxicity (oral) LD_{50}: > 2000 mg/kg bw (OECD 425)
Acute toxicity (dermal) LD_{50}: > 2000 mg/kg bw (OECD 402)
Acute toxicity (inhalative) LC_{50}: > 1200 mg/m³

Acute dermal toxicity:

Acute toxicity (oral) LD_{50}: > 2000 mg/kg bw (OECD 425)
Acute toxicity (dermal) LD_{50}: > 2000 mg/kg bw (OECD 402)
Acute toxicity (inhalative) LC_{50}: > 1200 mg/m³

Acute inhalation toxicity:

Acute toxicity (oral) LD_{50}: > 2000 mg/kg bw (OECD 425)
Acute toxicity (dermal) LD_{50}: > 2000 mg/kg bw (OECD 402)
Acute toxicity (inhalative) LC_{50}: > 1200 mg/m³

Skin corrosion/irritation:

No known symptoms to date.

Potassium sulphate

Respiratory or skin sensitisation:
No known symptoms to date.

Carcinogenicity:
No known symptoms to date. (OECD 471, 473, 476)
Oral NOAEL repro/developmental > 1500 mg/kg bw/day (OECD 422)
No experimental indications of in vitro mutagenicity exist.

Additional information:
Repeated dose toxicity (subacute, subchronic, chronic): Oral 28-day NOAEL > 1500 mg/kg bw/day (OECD 422)
Oral 52-weeks NOAELmale = 256 mg/kg bw/day (OECD 453)

*
11.2. Information on other hazards

Endocrine disrupting properties:
This substance does not have endocrine disrupting properties with respect to humans.

SECTION 12: Ecological information

12.1. Toxicity

Aquatic toxicity:
Acute (short-term) fish toxicity: 96-h LC_{50}: 680 mg/l (EPA)
Daphnia magna: 48-h EC_{50}: 720 mg/l (EPA)
Acute (short-term) toxicity to algae and cyanobacteria: 18-d EC_{50}: 2700 mg/l (no guideline)

Terrestrial toxicity:
Inhibition of microbial activity: EC_{50}: > 100 mg/l (weight of evidence)

12.2. Persistence and degradability

Abiotic degradation:
Hydrolysis: none

Biodegradation:
The methods for determining the biological degradability are not applicable to inorganic substances.

Additional information:
Further ecological information: Biodegradation: The methods for determining the biological degradability are not applicable to inorganic substances.

12.3. Bioaccumulative potential

Partition coefficient: n-octanol/water:
not applicable

Accumulation / Evaluation:
Partition coefficient: n-octanol/water not relevant (Product/Substance is inorganic.)
BCF: No indication of bioaccumulation potential.

12.4. Mobility in soil

adsorption coefficient Low

12.5. Results of PBT and vPvB assessment

potassium sulfate CAS No.: 7778-80-5 EC No.: 231-915-5
Results of PBT and vPvB assessment: —
Organic substances of vegetable origin
Results of PBT and vPvB assessment: —
water CAS No.: 7732-18-5 EC No.: 231-791-2
Results of PBT and vPvB assessment: —
potassium hydrogensulphate CAS No.: 7646-93-7 EC No.: 231-594-1
Results of PBT and vPvB assessment: —

The study does not need to be conducted because the substance is inorganic. (1907/2006/EC, Annex XIII)

*
12.6. Endocrine disrupting properties

This substance does not have endocrine disrupting properties with respect to humans.

Potassium sulphate

12.7. Other adverse effects
Further ecological information: none

SECTION 13: Disposal considerations

13.1. Waste treatment methods
Do not contaminate ground or surface water. Recycling possible after special treatment. Consult the appropriate local waste disposal expert about waste disposal.

13.1.1. Product/Packaging disposal

Waste codes/waste designations according to EWC/AVV

Waste code product

06 03 14	solid salts and solutions other than those mentioned in 06 03 11 and 06 03 13

Remark:
Evidence for disposal must be provided.

Waste code packaging

20 03 01	mixed municipal waste

Remark:
Evidence for disposal must be provided.

Waste treatment options

Appropriate disposal / Product:
Dispose of waste according to applicable legislation.

Appropriate disposal / Package:
Do not remove label until container is thoroughly cleaned. Rinsing with cold or lukewarm water.

SECTION 14: Transport information

Land transport (ADR/RID)	Inland waterway craft (ADN)	Sea transport (IMDG)	Air transport (ICAO-TI / IATA-DGR)
14.1. UN number or ID number			
No dangerous good in sense of these transport regulations.	No dangerous good in sense of these transport regulations.	No dangerous good in sense of these transport regulations.	No dangerous good in sense of these transport regulations.
14.2. UN proper shipping name			
No dangerous good in sense of these transport regulations.	No dangerous good in sense of these transport regulations.	No dangerous good in sense of these transport regulations.	No dangerous good in sense of these transport regulations.
14.3. Transport hazard class(es)			
not relevant	not relevant	not relevant	not relevant
14.4. Packing group			
not relevant	not relevant	not relevant	not relevant
14.5. Environmental hazards			
not relevant	not relevant	not relevant	not relevant
14.6. Special precautions for user			
not relevant	not relevant	not relevant	not relevant

14.7. Maritime transport in bulk according to IMO instruments
Not classified for this transport carrier.

SECTION 15: Regulatory information

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

15.1.1. EU legislation

Other regulations (EU):
Substance/mixture is not VOC relevant.

Potassium sulphate

15.1.2. National regulations

[DE] National regulations

Water hazard class

WGK:
1 - slightly hazardous to water

Source:
AwVS, Nr. 255 (Rigoletto)

15.2. Chemical Safety Assessment

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

SECTION 16: Other information

16.1. Indication of changes

11.2.	Information on other hazards
12.6.	Endocrine disrupting properties
15.1.	Safety, health and environmental regulations/legislation specific for the substance or mixture

16.2. Abbreviations and acronyms

Abbreviations:
CSA: Chemical Safety Assessment
PBT: Substance with persistent, bioaccumulative and toxic properties.
vPvB: Substance with very persistent and very bioaccumulative properties.
MFSU: Manufacture, formulation, supply and use
Rigoletto: Database of the German Federal Environmental Agency, which contains the classification of substances according to their water hazard class (https//webrigoletto.uba.de/Rigoletto/Home/Search).

16.3. Key literature references and sources for data

See annex

16.4. Classification for mixtures and used evaluation method according to regulation (EC) No 1272/2008 [CLP]

No data available

16.5. List of relevant hazard statements and/or precautionary statements from sections 2 to 15

Hazard statements	
H314	Causes severe skin burns and eye damage.
H335	May cause respiratory irritation.

16.6. Training advice

No data available

16.7. Additional information

This SDS is not required by Article 31 of Regulation 1907/2006/EU as the substance is not classified as hazardous, however, to comply with Article 32 of REACH and provide customers with relevant information the format of the SDS (according to Regulation 2015/830/EU) has been used. Given data sheets are based on our present experiences, however they are no assurance of product properties and do not justify a contractual legal relationship.
The safety data sheet is designed in accordance with the requirements of Regulation (EU) 2020/878.

* Data changed compared with the previous version.

ANNEX

1 Exposure scenario (1) **Manufacturing of the substance**	
Use descriptors related to the life cycle stage	SU8 PROC1/4/8a/8b/9/15 ERC1
Name of contributing environmental scenario (1) and corresponding ERC	1. Manufacturing of substances (ERC1)
List of names of contributing worker scenarios (2) and corresponding PROC	1. Use in closed process, no likelihood of exposure (PROC1) 2. Use in batch and other process (synthesis) where opportunity for exposure arises (PROC4) 3. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities (PROC8a) 4. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (PROC8b) 5. Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9) 6. Use as laboratory reagent (PROC15)
2.1 Contributing scenario (1) controlling environmental exposure	
Environmental release during manufacturing ERC1 An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.	
2.2 Contributing scenario (2) controlling worker exposure for manufacturing of the substance.	
All Process Categories are covered by this contributing scenario as all Operational Conditions (OCs) and Risk Management Measures (RMMs) are identical. PROC1/4/8a/8b/9/15	
Product characteristic	
Product related conditions, e.g. the concentration of the substance in a mixture, the physical state of that mixture (solid, liquid; if solid: level of dustiness), package design affecting exposure	Solid, low dustiness Liquid
Amounts used	
Amounts used at a workplace (per task or per shift); note: sometimes this information is not needed for assessment of worker's exposure	Not applicable
Frequency and duration of use/exposure	
Duration per task/activity (e.g. hours per shift) and frequency (e.g. single events or repeated) of exposure	More than 4 hours per day
Human factors not influenced by risk management	
Particular conditions of use, e.g. body parts potentially exposed as a result of the nature of the activity	Not applicable

Other given operational conditions affecting workers exposure	
Other given operational conditions: e.g. technology or process techniques determining the initial release of substance from process into workers environment; room volume, whether the work is carried out outdoors/indoors, process conditions related to temperature and pressure.	Indoors
Technical conditions and measures at process level (source) to prevent release	
Process design aiming to prevent releases and hence exposure of workers; this in particular includes conditions ensuring rigorous containment; performance of containment to be specified (e.g. by quantification of residual losses or exposure)	Not applicable
Technical conditions and measures to control dispersion from source towards the worker	
Engineering controls, e.g. exhaust ventilation, general ventilation; specify effectiveness of measure	1. Containment as appropriate 2. Good standard of general ventilation
Organisational measures to prevent /limit releases, dispersion and exposure	
Specific organisational measures or measures needed to support the functioning of particular technical measures (e.g. training and supervision). Those measures need to be reported in particular for demonstrating strictly controlled conditions (to justify exposure based waiving).	Not applicable
Conditions and measures related to personal protection, hygiene and health evaluation	
Personal protection, e.g. wearing of gloves, face protection, full body dermal protection, goggles, respirator; specify effectiveness of measure; specify the suitable material for the PPE (where relevant) and advise how long the protective equipment can be used before replacement (if relevant)	1. Chemical goggles

3 Exposure information and reference to its source

Information for contributing scenario 1

An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.

Information for contributing scenario 2

A qualitative approach was used to conclude safe use for workers.

The leading toxicological effect is eye irritation (local endpoint), for which no DNEL can be derived as no dose-response information is available. As no systemic effects were noted at such high levels of substance that humans are normally not exposed to (see DNELs), a quantitative assessment is not considered necessary.

4 Guidance to DU to evaluate whether he works inside the boundaries set by the ES

No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.

5 Additional good practice advice beyond the REACH CSA

Additional good practices (Operational Conditions and Risk Management Measures) beyond the REACH Chemical Safety Assessment established within Chemical Industry are also advised and communicated through Safety Data Sheets. Such as:

- Containment as appropriate;
- Minimise number of staff exposed;
- Segregation of the emitting process;
- Effective contaminant extraction;
- Good standard of general ventilation;
- Minimisation of manual phases;
- Avoidance of contact with contaminated tools and objects;
- Regular cleaning of equipment and work area;
- Management/supervision in place to check that RMMs in place are being used correctly and OCs

followed; - Training staff on good practice; - Good standard of personal hygiene;

1 Exposure scenario (2) **Industrial use for formulation of preparations, intermediate use and end-use in industrial settings.**	
Use descriptors related to the life cycle stage	SU3 PC0(UCN B50000, K35000, S35000)/12/19/20/23/26/27/34 PROC1/3/4/5/6/7/8a/8b/9/10/13/14/15/21/24/26 ERC2/3/4/5/6a/12b
Name of contributing environmental scenario (1) and corresponding ERC	1. Formulation of preparations (ERC2) 2. Formulation in materials (ERC3) 3. Industrial use of processing aids in processes and products, not becoming part of articles (ERC4) 4. Industrial use resulting in inclusion into or onto a matrix (ERC5) 5. Industrial use resulting in manufacture of another substance (use of intermediates) (ERC6a) 6. Industrial processing of articles with abrasive techniques (high release) (ERC12b)
List of names of contributing worker scenarios (2) and corresponding PROC	1. Use in closed process, no likelihood of exposure (PROC1) 2. Use in closed batch process (synthesis or formulation) (PROC3) 3. Use in batch and other process (synthesis) where opportunity for exposure arises (PROC4) 4. Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) (PROC5) 5. Calendering operations (PROC6) 6. Industrial spraying (PROC7) 7. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities (PROC8a) 8. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (PROC8b) 9. Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9) 10. Roller application or brushing (PROC10) 11. Treatment of articles by dipping and pouring (PROC13) 12. Production of preparations* or articles by tabletting, compression, extrusion, pelletisation (PROC14) 13. Use as laboratory reagent (PROC15) 14. Low energy manipulation of substances bound in materials and/or articles (PROC21) 15. High (mechanical) energy work-up of substances bound in materials and/or articles (PROC24) 16. Handling of solid inorganic substances at ambient temperature (PROC26)
2.1 Contributing scenario (1) controlling environmental exposure	
Formulation of preparations (ERC2) and of materials (ERC3). Industrial use of processing aids in processes and products, not becoming part of articles (ERC4), industrial use resulting in inclusion into or onto a matrix (ERC5), resulting in manufacture of another substance (use of intermediates, ERC6a) and industrial processing of articles with abrasive techniques (high release, ERC12b). An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.	
2.2 Contributing scenario (2) controlling worker exposure for industrial use for formulation of preparations, intermediate use and end-use in industrial settings.	
All Process Categories are covered by this contributing scenario as all Operational Conditions (OCs) and Risk Management Measures (RMMs) are identical. PROC1/3/4/5/6/7/8a/8b/9/10/13/14/15/21/24/26	
Product characteristic	

Product related conditions, e.g. the concentration of the substance in a mixture, the physical state of that mixture (solid, liquid; if solid: level of dustiness), package design affecting exposure	Solid, low dustiness Liquid
Amounts used	
Amounts used at a workplace (per task or per shift); note: sometimes this information is not needed for assessment of worker's exposure	Not applicable
Frequency and duration of use/exposure	
Duration per task/activity (e.g. hours per shift) and frequency (e.g. single events or repeated) of exposure	More than 4 hours per day
Human factors not influenced by risk management	
Particular conditions of use, e.g. body parts potentially exposed as a result of the nature of the activity	Not applicable
Other given operational conditions affecting workers exposure	
Other given operational conditions: e.g. technology or process techniques determining the initial release of substance from process into workers environment; room volume, whether the work is carried out outdoors/indoors, process conditions related to temperature and pressure.	Indoors
Technical conditions and measures at process level (source) to prevent release	
Process design aiming to prevent releases and hence exposure of workers; this in particular includes conditions ensuring rigorous containment; performance of containment to be specified (e.g. by quantification of residual losses or exposure)	Not applicable
Technical conditions and measures to control dispersion from source towards the worker	
Engineering controls, e.g. exhaust ventilation, general ventilation; specify effectiveness of measure	1. Containment as appropriate 2. Good standard of general ventilation
Organisational measures to prevent /limit releases, dispersion and exposure	
Specific organisational measures or measures needed to support the functioning of particular technical measures (e.g. training and supervision). Those measures need to be reported in particular for demonstrating strictly controlled conditions (to justify exposure based waiving).	Not applicable
Conditions and measures related to personal protection, hygiene and health evaluation	
Personal protection, e.g. wearing of gloves, face protection, full body dermal protection, goggles,	1. Chemical goggles

respirator; specify effectiveness of measure; specify the suitable material for the PPE (where relevant) and advise how long the protective equipment can be used before replacement (if relevant)	

3 Exposure information and reference to its source

Information for contributing scenario 1

An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.

Information for contributing scenario 2

A qualitative approach was used to conclude safe use for workers.

The leading toxicological effect is eye irritation (local endpoint), for which no DNEL can be derived as no dose-response information is available. As no systemic effects were noted at such high levels of substance that humans are normally not exposed to (see DNELs), a quantitative assessment is not considered necessary.

4 Guidance to DU to evaluate whether he works inside the boundaries set by the ES

No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.

5 Additional good practice advice beyond the REACH CSA

Additional good practices (Operational Conditions and Risk Management Measures) beyond the REACH Chemical Safety Assessment established within Chemical Industry are also advised and communicated through Safety Data Sheets. Such as:

- Containment as appropriate;
- Minimise number of staff exposed;
- Segregation of the emitting process;
- Effective contaminant extraction;
- Good standard of general ventilation;
- Minimisation of manual phases;
- Avoidance of contact with contaminated tools and objects;
- Regular cleaning of equipment and work area;
- Management/supervision in place to check that RMMs in place are being used correctly and OCs followed;
- Training staff on good practice;
- Good standard of personal hygiene;

1 Exposure scenario (3) **Professional use in formulation of preparations and end-use**	
Use descriptors related to the life cycle stage	SU22 PC0(UCN B50000, K35000, S35000)/12/21/27/35 PROC8a/8b/9/10/11/13/15/19/24/26 ERC8a/8b/8c/8d/8e/10b/11b
Name of contributing environmental scenario (1) and corresponding ERC	1. Wide dispersive indoor use of processing aids in open systems (ERC8a) 2. Wide dispersive indoor use of reactive substances in open systems (ERC8b) 3. Wide dispersive indoor use resulting in inclusion into or onto a matrix (ERC8c) 4. Wide dispersive outdoor use of processing aids in open systems (ERC8d) 5. Wide dispersive outdoor use of reactive substances in open systems (ERC8e) 6. Wide dispersive outdoor use of long-life articles and materials with high or intended release (including abrasive processing, ERC10b) 7. Wide dispersive indoor use of long-life articles and materials with high or intended release (including abrasive processing, ERC11b)
List of names of contributing worker scenarios (2) and corresponding PROC	1. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities (PROC8a) 2. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (PROC8b) 3. Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9) 4. Roller application or brushing (PROC10) 5. Non industrial spraying (PROC11) 6. Treatment of articles by dipping and pouring (PROC13) 7. Use as laboratory reagent (PROC15) 8. Hand-mixing with intimate contact and only PPE available (PROC19) 9. High (mechanical) energy work-up of substances bound in materials and/or articles (PROC24) 10. Handling of solid inorganic substances at ambient temperature (PROC26)
2.1 Contributing scenario (1) controlling environmental exposure	
Wide dispersive indoor use of processing aids in open systems (ERC8a), of reactive substances in open systems (ERC8b), resulting in inclusion into or onto a matrix (ERC8c), of long-life articles and materials with high or intended release (including abrasive processing, ERC11b). Wide dispersive outdoor use of processing aids in open systems (ERC8d) and of reactive substances in open systems (ERC8e), of long-life articles and materials with high or intended release (including abrasive processing, ERC10b). An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.	
2.2 Contributing scenario (2) controlling worker exposure for professional use in formulation of preparations and end-use	
All Process Categories are covered by this contributing scenario as all Operational Conditions (OCs) and Risk Management Measures (RMMs) are identical. PROC8a/8b/9/10/11/13/15/19/24/26	
Product characteristic	

Product related conditions, e.g. the concentration of the substance in a mixture, the physical state of that mixture (solid, liquid; if solid: level of dustiness), package design affecting exposure	Solid, low dustiness Liquid, >25% substance in the product
Amounts used	
Amounts used at a workplace (per task or per shift); note: sometimes this information is not needed for assessment of worker's exposure	Not applicable
Frequency and duration of use/exposure	
Duration per task/activity (e.g. hours per shift) and frequency (e.g. single events or repeated) of exposure	More than 4 hours per day
Human factors not influenced by risk management	
Particular conditions of use, e.g. body parts potentially exposed as a result of the nature of the activity	Not applicable
Other given operational conditions affecting workers exposure	
Other given operational conditions: e.g. technology or process techniques determining the initial release of substance from process into workers environment; room volume, whether the work is carried out outdoors/indoors, process conditions related to temperature and pressure.	Indoors or outdoors
Technical conditions and measures at process level (source) to prevent release	
Process design aiming to prevent releases and hence exposure of workers; this in particular includes conditions ensuring rigorous containment; performance of containment to be specified (e.g. by quantification of residual losses or exposure)	Not applicable
Technical conditions and measures to control dispersion from source towards the worker	
Engineering controls, e.g. exhaust ventilation, general ventilation; specify effectiveness of measure	1. Containment as appropriate 2. Good standard of general ventilation 3. Avoid splashing. Use specific dispensers and pumps specifically to designed to prevent splashes/spills/exposure to occur
Organisational measures to prevent /limit releases, dispersion and exposure	
Specific organisational measures or measures needed to support the functioning of particular technical measures (e.g. training and supervision). Those measures need to be reported in particular for demonstrating strictly controlled conditions (to justify exposure based waiving).	Not applicable
Conditions and measures related to personal protection, hygiene and health evaluation	
Personal protection, e.g. wearing of	1. Chemical goggles

gloves, face protection, full body dermal protection, goggles, respirator; specify effectiveness of measure; specify the suitable material for the PPE (where relevant) and advise how long the protective equipment can be used before replacement (if relevant)	

3 Exposure information and reference to its source

Information for contributing scenario 1

An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.

Information for contributing scenario 2

A qualitative approach was used to conclude safe use for workers.

The leading toxicological effect is eye irritation (local endpoint), for which no DNEL can be derived as no dose-response information is available. As no systemic effects were noted at such high levels of substance that humans are normally not exposed to (see DNELs), a quantitative assessment is not considered necessary.

4 Guidance to DU to evaluate whether he works inside the boundaries set by the ES

No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.

5 Additional good practice advice beyond the REACH CSA

Additional good practices (Operational Conditions and Risk Management Measures) beyond the REACH Chemical Safety Assessment established within Chemical Industry are also advised and communicated through Safety Data Sheets. Such as:

- Containment as appropriate;
- Minimise number of staff exposed;
- Segregation of the emitting process;
- Effective contaminant extraction;
- Good standard of general ventilation;
- Minimisation of manual phases;
- Avoidance of contact with contaminated tools and objects;
- Regular cleaning of equipment and work area;
- Management/supervision in place to check that RMMs in place are being used correctly and OCs followed;
- Training staff on good practice;
- Good standard of personal hygiene;

1 Exposure scenario (4) **Consumer end-use of fertilizers and other products**	
Use descriptors related to the life cycle stage	SU21 PC0(UCN K35000, S35000)/12/27 ERC8a/8b/8c/8d/8e/11b
Name of contributing environmental scenario (1) and corresponding ERC	1. Wide dispersive indoor use of processing aids in open systems (ERC8a) 2. Wide dispersive indoor use of reactive substances in open systems (ERC8b) 3. Wide dispersive indoor use resulting in inclusion into or onto a matrix (ERC8c) 4. Wide dispersive outdoor use of processing aids in open systems (ERC8d) 5. Wide dispersive outdoor use of reactive substances in open systems (ERC8e) 6. Wide dispersive indoor use of long-life articles and materials with high or intended release (including abrasive processing, ERC11b)
List of names of contributing consumer scenarios (2) and corresponding PC and sub-product categories if applicable	1. Construction materials, abrasives – surface treatment (PC0; K35000, S35000) 2. Fertilizers (PC12) 3. Plant protection products (PC27)
2.1 Contributing scenario (1) controlling environmental exposure	
Wide dispersive indoor use of processing aids in open systems (ERC8a), reactive substances in open systems (ERC8b) and of long-life articles and materials with high or intended release (including abrasive processing, ERC11b). Wide dispersive indoor use resulting in inclusion into or onto a matrix (ERC8c). Wide dispersive outdoor use of processing aids in open systems (ERC8d) and of reactive substances in open systems (ERC8e). An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.	
2.2 Contributing scenario (2) Consumer end-use of fertilizers and other products	
All Product Categories are covered by this contributing scenario as all Operational Conditions (OCs) and Risk Management Measures (RMMs) are identical. Potassium sulphate (with ≥1% and <3% KHSO4) is classified as irritating to eyes (H319 under CLP). Exposure to eye irritating dilutions can occur during consumer use of construction materials and abrasives (PC0), fertilizers (PC12) and plant protection products (PC27) due to dust/splashes. However, it has to be noted that the end products are further diluted which can lead to levels at which no eye irritation will occur.	
Product characteristic	
Product related conditions, e.g. the concentration of the substance in a mixture, the physical state of that mixture (solid, liquid; if solid: level of dustiness), package design affecting exposure	Solid, low dustiness Liquid Products containing potassium sulphate containing ≥1% or <1% KHSO4
Amounts used	
Amounts used per event	Not applicable
Frequency and duration of use/exposure	
Duration of exposure per event and frequency of events; please note: Tier 1 exposure assessment usually refers to external event exposure, without taking into account the duration and frequency of the event (see Guidance Chapter R.15);	Not applicable
Human factors not influenced by risk management	

Particular conditions of use, e.g. body parts potentially exposed; population potentially exposed (adults, children)	Not applicable
Other given operational conditions affecting workers exposure	
Other operational conditions e.g. room volume, air exchange rate, outdoor or indoor use	Indoors or outdoors
Conditions and measures related to information and behavioral advice to consumers	
Safety advice to be communicated to consumers in order to control exposure, e.g. technical instruction, behavioral advice;	Avoid splashing.
Conditions and measures related to personal protection and hygiene	
Personal protection, e.g. wearing of gloves, face protection, full body dermal protection, goggles, respirator; specify effectiveness of measure; specify the suitable material for the PPE (where relevant) and advise how long the protective equipment can be used before replacement (if relevant).	1. If potassium sulphate containing ≥1% KHSO4: Use chemical goggles 2. If potassium sulphate containing <1% KHSO4: No personal protection needed 3. Instructions addressed to the consumer via product labelling

3 Exposure information and reference to its source

Information for contributing scenario 1

An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.

Information for contributing scenario 2

A qualitative approach was used to conclude safe use for consumers.

The leading toxicological effect is eye irritation (local endpoint), for which no DNEL can be derived as no dose-response information is available. As no systemic effects were noted at such high levels of substance that humans are normally not exposed to (see DNELs), a quantitative assessment is not considered necessary.

4 Guidance to DU to evaluate whether he works inside the boundaries set by the ES

No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers/consumers for use of construction materials and abrasives, fertilisers, plant protection products:

If potassium sulphate containing ≥1% KHSO4: Use chemical goggles

If potassium sulphate containing <1% KHSO4: No personal protection needed