



KYNOCH FERTILIZER

SAFETY DATA SHEET

2:3:2(22) + 5%S + 8%Ca + 0.5%Zn

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Prepared according to: United Nations GHS (Rev 9E) (2021) and SANS 10234:2019
(This Safety Data Sheet conforms to the requirements set by the Department of Agriculture, Land reform and Rural development of the Republic of South Africa on the 29 March 2022)

SECTION 1: IDENTIFICATION

1.1 GHS¹ product identification

Product Name : **2:3:2(22) + 5%S + 8%Ca + 0.5%Zn**

¹ GHS - Globally Harmonized System of Classification and Labelling of Chemicals

1.2 Other means of identification

Description : **Blend (N,P,K and S) made with < 10% Urea and 0.5%Zn**

CAS Number : **N/A**

EC Number³ : **N/A**

² "CAS Number" - CAS Number is a numerical designation for chemicals that is maintained by the Chemical Abstracts Service (CAS) of the American Chemical Society.

³ "EC Number" - The European Community number (EC number) is a unique identifier that was assigned to substances for regulatory purposes within the European Union by the European Commission.

1.3 Recommended use of materials and restrictions on use

Recommended use of material : **Intended to be used as a fertilizer and in fertilizer blends**

Description : **Source of plant nutrients**

Restrictions on use : **None Identified**

1.4 Supplier's details

Supplier's details : **1st Floor, ETG House
62 Weirda Road East
Sandton
2196
Tel no: (011) 317-2000**

1.5 Emergency phone number

Emergency phone number : **Dial Triple Zero (000) and ask for fire
: Ambulance or the Fire department – 10177
: Kynoch – 086 092 7272
: Spilltech - 086 100 0366**

SECTION 2: HAZARD IDENTIFICATION

2.1 Classification of substance or mixture

Product Defined : **Mixture**

Summarized Classification

| Types of Hazards | Hazard Class | Category/subcategory | H-Statement |
|-----------------------|----------------------------------------------------|----------------------|--------------|
| Physical Hazards | Not Classified | | ² |
| Health Hazards | Not Classified | | |
| Environmental Hazards | Hazardous to the aquatic environment, acute hazard | Category 3 | H402 |

Classification according to the United Nations GHS (Rev 9E) (2021) and SANS 10234:2019

¹ "Not Classified" – Data conclusive but not at sufficient levels for classification.

² "H-Statement" – Hazard Statement. Full decryption in Section16

Reference: (European Chemical Agency [ECHA], n.d.) & (Environmental protection agency [EPA]. New Zealand Government, n.d.) & (The Australian Industrial Chemicals Introduction Scheme [AICIS], n.d.) & (International Labour organization [ILO], n.d.)

2.2 GHS Label elements, including precautionary statements

Pictogram : **No Pictogram**
Pictogram Name : **No Pictogram**
Signal Word : **No Signal Word**
Hazard Statements : **H402 - Harmful to aquatic life**
Precautionary Statements : **P273 - Avoid release to the environment.**

Reference: (Pubchem, GHS, n.d.)

2.3 Other hazards that do not result in classification

Hazards : **Can cause serous eye irritation**

Reference: (European Chemical Agency [ECHA], n.d.) & (Pubchem, search, n.d.)

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substance

Substance : **N/A**

¹ "N/A" – Not available

Reference: (European Chemical Agency [ECHA], n.d.) & (The Australian Industrial Chemicals Introduction Scheme [AICIS], n.d.)

3.2 Mixture

Substance A:

| | |
|------------------|------------------------------------|
| Common name | : Urea Granular |
| Composition | < 10% |
| EC Name | Carbamide |
| Chemical Formula | : CH ₄ N ₂ O |
| Molecular Weight | : 60,05 g/mol |
| Nutrient Content | : 46% N |
| CAS Number | : 57-13-6 |
| EC Number | : 200-315-5 |

Substance B:

| | |
|------------------|-------------------------------------------------------|
| Common name | : Mono Ammonium Phosphate |
| Composition | : 0-80% |
| EC Name | : Ammonium dihydrogen orthophosphate |
| Chemical Formula | : (NH ₄)(H ₂ PO ₄) |
| Molecular Weight | : 115,025 g/mol |
| Nutrient Content | : 11% N 22% P |
| CAS Number | : 7722-76-1 |
| EC Number | : 231-764-5 |

Substance C:

| | |
|------------------|-------------------------------|
| Common name | : Potassium Chloride Granular |
| Composition | : 0-60% |
| EC Name | : Potassium Chloride |
| Chemical Formula | : KCl |
| Molecular Weight | : 74.55 g/mol |
| Nutrient Content | : 50% K |
| CAS Number | : 7447-40-7 |
| EC Number | : 200-315-5 |

Substance D:

| | |
|------------------|---------------|
| Common name | : Zinc Oxide |
| Composition | : < 1.6% |
| EC Name | : Zinc Oxide |
| Chemical Formula | : ZnO |
| Molecular Weight | : 81,38 g/mol |
| Nutrient Content | : 40% Zn |
| CAS Number | : 1314-13-2 |
| EC Number | : 215-222-5 |

Component E

| | |
|------------------|---------------------|
| Common name | : Gypsum Pellets |
| Composition | 0- 40% |
| EC Name | : Calcium sulphate |
| Chemical Formula | : CaSO ₄ |
| Molecular Weight | : 136,14 g/mol |
| Nutrient Content | : 18%S, 24%Ca |
| CAS Number | : 7778-18-9 |
| EC Number | : 231-900-3 |

SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures

| | |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| General information | : No special measures required. |
| After inhalation | : Supply fresh air. Consult doctor in case of complaints. |
| After skin contact | : Remove affected clothing. Immediately rinse with water (can use mild soap). If skin irritation continues, consult a doctor. |
| After eye contact | : Rinse opened eye for several minutes under running water (remove contact lenses if easily possible). Seek medical treatment. |
| After swallowing | : Rinse out mouth. Make victim drink water (maximum of 2 drinking glasses). Do NOT induce vomiting. If symptoms persist consult doctor. |

4.2 Most important symptoms and effects, both acute and delayed

| | |
|---------|-----------------------------------|
| Effects | : Can cause serous eye irritation |
|---------|-----------------------------------|

4.3 Indication of any immediate medical attention and special treatment needed

No further relevant information available

SECTION 5: FIRE-FIGHTING MEASURES

5.1 Suitable extinguishing medium

| | |
|-----------------------------------|----------------------------------------------------------------------|
| Suitable extinguishing agents | : Water, CO ₂ , foam, powder |
| Inappropriate extinguishing media | : No information available |
| Notes | : Use fire extinguishing methods suitable to surrounding conditions. |

5.2 Specific hazards arise from chemical

| | |
|-------------------------------|-------------------------------------------------------------------------------|
| Warning | : Formation of toxic gases is possible during heating or in case of fire. |
| Hazardous Combustion Products | : Nitrogen oxides (NOx). Carbon monoxide (CO). Carbon dioxide (CO2). Ammonia. |
| Fire hazard | : Non-flammable substance |
| Explosion hazard | : Not applicable |
| Reactivity | : None |

5.3 Special protective action for Fire-Fighters

| | |
|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Special protective actions for fire-fighters | : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. : No action shall be taken involving any personal risk or without suitable training. |
| Special protective equipment for fire-fighters | : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. : Clothing for fire-fighters (including helmets, protective boots, and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents. |

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment, and emergency procedures

| | |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Percussions | : No action shall be taken involving any personal risk or without suitable training. |
| Equipment | : Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment. |
| Procedure | : Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Provide adequate ventilation. |

¹ PPE – Personal precautions, protective equipment.

6.2 Environmental precautions

| | |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Environmental | : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. : Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil, or air). : Discharge into the environment must be avoided. |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

6.3 Methods and material for containment and cleaning up

- Small Spill : Move containers from spill area. Vacuum or sweep up material and place in a designated, labelled waste container. Dispose of via a licensed waste disposal contractor.
- Large Spill : Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements, or confined areas. Vacuum or sweep up material and place in a designated, labelled waste container. Dispose of via a licensed waste disposal contractor.

6.4 Reference to other sections

- Section 7 : Information on safe handling.
- Section 8 : Information on personal protection equipment.
- Section 13 : For disposal information.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

- Handling : Ensure adequate ventilation. Avoid ingestion and inhalation. Avoid dust formation. Wear protective gloves/eye protection/face protection/. Do not get in eyes, on skin, or on clothing. Wash hands thoroughly after handling.
- : Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs. Provide appropriate exhaust ventilation at places where dust is formed.
- : For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

- Storerooms and receptacles : No special requirements.
- One common storage facility : Store away from oxidising agents.
- Handling of product : Keep container tightly closed.
- Room conditions : Keep in a dry, well-ventilated place. Recommended storage temperature at < 30°C. (Room temperature). DO NOT expose the substance to temperatures above 50 °C.
- : Protect against humidity
- Storage Class : (TRGS 510): 10 - 13 Other liquids and solids: Non-Combustible Solids

Reference: (BAUA, 2016)

7.3 Specific end use(s)

- Specific end use(s) : Apart from the uses mentioned in section 1.3 no other specific uses are stipulated

SECTION 8: EXPOSURE CONTROL AND PERSONNEL PROTECTION

8.1 Control Parameters

| | Compound | Cas Number | | TWA ¹ | STEL ² |
|------|--------------------|------------|--|------------------|-------------------|
| OCHA | Urea | 57-13-6 | | 10mg/l | Not Listed |
| OCHA | MAP | 7722-76-1 | | Not Listed | Not Listed |
| OCHA | Potassium Chloride | 7447-40-7 | | Not Listed | Not Listed |
| OCHA | Zinc Oxide | 1314-13-2 | | Not Listed | Not Listed |

¹ TWA – Long term exposure: Time Weighted Average (8-hour period)

² STEL – Short term exposure: Short term exposure limit (15 min period)

Reference: (South African Labour Department, 2021) & (ILO, n.d.) & (OSHA, n.d.)

- Routes of exposure : **The substance can be absorbed into the body by inhalation of its aerosol and by ingestion.**
- Inhalation risk : **Evaporation at 20°C is negligible; a nuisance-causing concentration of airborne particles can, however, be reached quickly, especially if powdered.**
- Effects of short-term exposure : **Contact can irritate the skin and eyes**
- Effects of long-term or repeated exposure : **Repeated exposure to ammonia may cause chronic irritation of the respiratory tract.**

Reference: (ILO, n.d.)

8.2 Appropriate engineering controls

- : **Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations, and safety showers are close to the workstation location.**
See Section 7.

8.2 Individual protection measures

- Eye/face protection : **Wear safety glasses.**
Use equipment for eye protection tested and approved under appropriate government standards. SABS adoption: SANS 50166:2018(SA), EN 166(EU) or NIOSH (US).
- Skin Protection : **Handle with gloves.**
Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.
- Body Protection : **Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.**

| | |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Respiratory protection | : Not required under normal conditions of use. Where protection from nuisance levels of dusts is desired, use type N95 (US) or type P1 (EN 143) dust masks. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). |
| Control of environmental exposure | No special environmental precautions required |



SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Properties

| | |
|----------------------------------------------------------|-----------------------------------------------------|
| Physical state | : Solid ¹ |
| Composition | : Mixture ² |
| Colour | : Colourless / White to brown, red and black |
| Odour | : Odourless |
| Melting point/freezing point | : 133-134 °C |
| Boiling point or initial boiling point and boiling range | : Decomposes |
| Flammability | : Product is not flammable |
| Lower and upper explosion limit/flammability limit | : Not determined |
| Flash point | : Not applicable |
| Auto-ignition temperature | : Not determined |
| Oxidizing Properties | : Non oxidizer |
| Decomposition temperature | : ≥150 °C |
| pH | : Not Available |
| Kinematic viscosity | : N/A |
| Solubility | : N/A |
| Partition coefficient: n-octanol/water (log value) | : N/A |
| Vapour pressure | : N/A |
| Density and/or relative density | : N/A |
| Relative vapour density | : N/A |
| Bulk Density (Volumetric) | : N/A |
| Particle characteristics | : between 0.1 - 5mm |

Molecular Formula : N/A

Molecular Weight : N/A

¹ "Solid" – Is a substance that cannot be classified as a liquid or Gas.

² "Substance" – Is chemical elements and their compounds in their natural state or obtained by production process)

Reference: (ECHA, n.d.) & (Pubchem, search, n.d.)

SECTION 10: STABILITY AND REACTIVITY

| | |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Reactivity | : None known, based on information available |
| Chemical stability | : Stable under normal conditions |
| Hazardous Reactions | : None under normal processing |
| Conditions to Avoid | : Incompatible products |
| Incompatible Materials | : Urea: strong oxidizing agents, Chlorine, sodium hypochlorite MAP: Magnesium, Strong acids, bases. KCl: Strong acids and strong oxidizing agents ZnO: Acids; Bases |
| Hazardous Decomposition Products | : Urea: Products Nitrogen oxides (NOx), Carbon monoxide (CO), Carbon dioxide (CO ₂), Ammonia MAP: Toxic fumes: Ammonia KCl: Potassium oxides and chlorine gas ZnO: ZnO-fume can be generated during thermal processing. |

SECTION 11: TOXICOLOGY

11.1 Acute Toxicity

| | |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Classification | : No Classification |
| Description | : Although Ammonium Sulphate is classified as Acute Tox. 4, the rest of the components are not classified. The amount in the final mixture too little to warrant a classification according to the GHS guidelines. |

Substance A:

| Method | Compound | Cas Number | LD50 | Subject |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------|---------|
| Oral | Urea | 57-13-6 | 14.3-15 g/kg | Rat |
| | | | 11.5-13 g/kg | Mouse |
| Dermal | No data are available. Urea is demonstrated to be of very low acute toxicity by the oral, subcutaneous and intravenous routes in the rat and mouse. Testing for acute dermal toxicity is not justified. | | | |
| Inhalation | No data are available. The substance is a non-volatile solid and is produced as crystals with a particle size of >100 µm. There is therefore no potential for inhalation exposure. | | | |
| Subcutaneous | Urea | 57-13-6 | 8.2-9.4 g/kg | Rat |
| | | | 9.2-10.7 g/kg | Mouse |
| Intravenous | Urea | 57-13-6 | 5.3-5.4 g/kg | Rat |
| | | | 4.6-5.2 g/kg | Mouse |

Substance B:

| Method | Compound | Cas Number | Measure | Value | Subject |
|------------|----------|------------|-------------------|-----------------------------|---------|
| Oral | MAP | 7722-76-1 | LD50 ¹ | >2000 mg/kg bw ² | Rat |
| Inhalation | MAP | 7722-76-1 | LC50 | >5 mg/L | Rat |
| Dermal | MAP | 7722-76-1 | LD50 | >5000 mg/kg bw | Rat |

Substance C:

| Method | Compound | Cas Number | LD50 | Subject |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------|------------|
| Oral | Potassium chloride | 7447-40-7 | 2600 mg/kg | Rat |
| | | | 1500 mg/kg | Mouse |
| Dermal | No data are available. Potassium chloride is demonstrated to be of very low acute toxicity by the oral, subcutaneous and intravenous routes in the rat and mouse. Testing for acute dermal toxicity is not justified. | | | |
| Inhalation | No data are available. The substance is a non-volatile solid and is produced as crystals with a particle size of >100 µm. There is therefore no potential for inhalation exposure. | | | |
| Subcutaneous | Potassium chloride | 7447-40-7 | 2550 mg/kg | Guinea pig |
| | | | 9.2-10.7 g/kg | Mouse |
| Intravenous | Potassium chloride | 7447-40-7 | 142 mg/kg | Rat |
| | | | 117 mg/kg | Mouse |

Substance D:

| Method | Compound | Cas Number | Measure | Value | Subject |
|------------|------------|------------|-------------------|-----------------------------|---------|
| Oral | Zinc Oxide | 1314-13-2 | LD50 ¹ | >5000 mg/kg bw ² | Rat |
| Inhalation | Zinc Oxide | 1314-13-2 | LC50 | >5.7 mg/L | Rat |
| Dermal | Zinc Oxide | 1314-13-2 | LD50 | >2000 mg/kg bw | Rat |

¹ "LD50" – Lethal Doses. The dosage at which 50% mortality was observed.

² "bw" - body-weight/day

Reference: (ECHA, n.d.) & (Pubchem, search, n.d.) & (EPA. New Zealand Government, n.d.)

11.2 Skin corrosion/irritation

- Classification : **No classification**
- Description : **None of the component was classified as skin corrosive/irritant.**
- Subjects : **Humans, Rabbits**

Reference: (ECHA, n.d.) & (Pubchem, search, n.d.)

11.3 Serious eye damage/irritation

- Classification : **No Classification**
- Description : **Urea Classified as an Eye Irritation, Category 2A. Potassium Chloride is irritating to the eyes but does not cause a classification. MAP and Ammonium Sulphate is not irritating. The amount in the final mixture too little to warrant a classification according to the GHS guidelines.**
- Subjects : **Humans, Rabbits**

Reference: (ECHA, n.d.) & (EPA. New Zealand Government, n.d.) & (Pubchem, search, n.d.)

11.4 Respiratory or skin sensitisation

Classification : **No classification**
Description : **None of the component was classified as skin corrosive/irritant.**

Reference: (ECHA, n.d.) & (Pubchem, search, n.d.)

11.5 Germ cell mutagenicity

: **No classification**
: **None of the component was classified as skin corrosive/irritant.**

Reference: (ECHA, n.d.) & (Pubchem, search, n.d.)

11.6 Carcinogenicity

: **No classification**
: **None of the component was classified as skin corrosive/irritant.**
: **Rat and Mouse**

Reference: (ECHA, n.d.) & (Pubchem, search, n.d.)

11.7 Reproductive toxicity

No Classification
: **Only data on Ammonium Sulphate and MAP is available, but both are not classified.**

Reference: (ECHA, n.d.) & (Pubchem, search, n.d.)

11.8 STOT² - single exposure

No data available

² "STOT" - Specific target organ toxicity.

Reference: (ECHA, n.d.) & (Pubchem, search, n.d.)

11.9 STOT² - repeated exposure

No data available

² "STOT" - Specific target organ toxicity.

Reference: (ECHA, n.d.) & (Pubchem, search, n.d.)

11.10 Aspiration hazard

No data available

Reference: (ECHA, n.d.) & (Pubchem, search, n.d.)

11.11 Route of Exposure and potential effects

| | |
|---------------|---------------------------------------------------|
| Swallowing | : Convulsions. Headache. Nausea. Vomiting. |
| Inhalation | : Cough. Shortness of breath. Sore throat |
| Eye exposure | : Redness |
| Skin exposure | : Redness |

Reference: (ECHA, n.d.) & (Pubchem, search, n.d. / Referencing ILO)

11.12 Long- and short-term effects

No data available

Reference: (ECHA, n.d.)

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity

Classification : **Zinc Oxide is classified as (H400 + H410) Hazardous to the aquatic environment, long-term hazard, Category 1, Class 9**
Of all the substances only Zinc Oxide was classified

Aquatic Toxicity

Substance A:

| Compound | Cas Number | Organism | Species | Time | Measure | Value |
|----------|------------|---------------------------------|--------------------|------|-------------------|--------------|
| Urea | 57-13-6 | Fish | Danio | 96-h | LC50 ¹ | 21 060 mg/L |
| Urea | 57-13-6 | Fish | Mozambique Tilapia | 28-d | EC10 ³ | 7 250 mg/L |
| Urea | 57-13-6 | Aquatic invertebrates | Daphnia | 24-h | EC50 ¹ | >10 000 mg/L |
| Urea | 57-13-6 | Aquatic invertebrates | Daphnia | 21-d | EC10 ³ | 141 mg/L |
| Urea | 57-13-6 | Aquatic Algae and Cyanobacteria | Green alga | 92-h | EC50 ¹ | 24 542 mg/L |
| | | | | 72-h | EC10 ³ | 6 896 mg/L |
| Urea | 57-13-6 | microorganisms | Pseudomonas putida | 72-h | EC50 ¹ | >10 000 mg/L |

Substance B:

| Compound | Cas Number | Organism | Species | Time | Measure | Value |
|----------|------------|---------------------------------|-----------------------------------------------------|------|-------------------|-----------|
| MAP | 7722-76-1 | Fish | Rainbow trout | 96-h | LC50 ¹ | >100 mg/L |
| MAP | 7722-76-1 | Aquatic invertebrates | Daphnia Carinata | 48-h | EC50 ₁ | >100 mg/L |
| MAP | 7722-76-1 | Aquatic Algae and Cyanobacteria | Desmodesmus Subscpicatus | 72-h | EC50 ₁ | >100 mg/L |
| MAP | 7722-76-1 | Micro-organisms | Activated sludge of a predominantly domestic sewage | 3-h | EC50 | >100 mg/L |

Substance C:

| Compound | Cas Number | Organism | Species | Time | Measure | Value |
|----------|------------|---------------------------------|-------------------------|------|-------------------|-----------|
| KCl | 7447-40-7 | Fish | Pimephales promelas | 96-h | LC50 ¹ | 880 mg/L |
| KCl | 7447-40-7 | Fish | Pimephales promelas | 28-d | EC10 ³ | N/A |
| KCl | 7447-40-7 | Aquatic invertebrates | Daphnia magna | 24-h | EC50 ¹ | 660 mg/L |
| KCl | 7447-40-7 | Aquatic invertebrates | Daphnia magna | 21-d | EC10 ³ | N/A |
| KCl | 7447-40-7 | Aquatic Algae and Cyanobacteria | Scenedesmus subspicatus | 72-h | EC10 ³ | 100 mg/L |
| KCl | 7447-40-7 | Microorganisms | - | 3-h | EC50 ¹ | 1000 mg/L |

Substance D:

| Compound | Cas Number | Organism | Species | Time | Measure | Value |
|------------|------------|---------------------------------|-------------------------|---------|-------------------|------------|
| Zinc Oxide | 1314-13-2 | Fish | Oncorhynchus Mykiss | 96-h | LC50 ¹ | 0.169 mg/L |
| Zinc Oxide | 1314-13-2 | Fish | Unknown | Unknown | NOEC ³ | 0.044 mg/L |
| Zinc Oxide | 1314-13-2 | Aquatic invertebrates | Daphnia magna | 24-h | EC50 ¹ | 660 mg/L |
| Zinc Oxide | 1314-13-2 | Aquatic invertebrates | Daphnia magna | 21-d | EC10 ³ | N/A |
| Zinc Oxide | 1314-13-2 | Aquatic Algae and Cyanobacteria | Scenedesmus subspicatus | 72-h | EC10 ³ | 100 mg/L |
| Zinc Oxide | 1314-13-2 | Microorganisms | - | 3-h | EC50 ¹ | 1000 mg/L |

Terrestrial Toxicity

:

Substance A:

| Compound | Cas Number | Organism | Species | Time | Measure | Value |
|----------|------------|------------------------|-----------------------------------------------|------|--------------------------------|----------------------|
| Urea | 57-13-6 | Micro-organisms | - | 24-d | NOEC ² | > 2358 mg urea/kg dw |
| Urea | 57-13-6 | Macro-organisms | Earthworms | 14-d | LC50 ¹ | 2 000 mg/kg soil dw |
| Urea | 57-13-6 | Macro-organisms | Earthworms | 60-d | EC10 ³ ₂ | 160 mg/kg soil dw |
| Urea | 57-13-6 | Anthropoids | Collembola, Mites, bees | 36-w | NOED | 640 mg/kg soil dw |
| Urea | 57-13-6 | Terrestrial plants | Mono and Dicots | 7-d | EC10 ³ | 1 000 mg/kg soil dw |
| Urea | 57-13-6 | Birds | Chickens | 21-d | LC50 ¹ | > 150 g/kg feed |
| Urea | 57-13-6 | Above-ground organisms | amphibians | 96-h | LC50 ¹ | > 482 kg/ha |
| Urea | 57-13-6 | Above-ground organisms | Various mammals (39 different groups/species) | - | NOEC ² | > 1 600 kg/ha |
| Urea | 57-13-6 | Above-ground organisms | Ruminants, Cattle, Sheep | 24-h | LD0 ⁴ | 1 000 mg/kg bw |
| Urea | 57-13-6 | Above-ground organisms | Cattle | 56-d | LD0 ⁴ | 600 mg/kg bw |

| Compound | Cas Number | Organism | Species | Time | Measure | Value |
|----------|------------|------------------------|------------------------|------|--------------------|--------------|
| Urea | 57-13-6 | Above-ground organisms | Ruminants, Deer, Moose | - | LDO ^{4 2} | 500 mg/kg bw |

Substance D:

| Compound | Cas Number | Organism | Species | Time | Measure | Value |
|------------|------------|--------------------|----------------------|---------|-------------------|--------------------|
| Zinc Oxide | 1314-13-2 | Micro-organisms | 6 Different Species | Unknown | NOEC ² | 35.7-1634 mg/kg dw |
| Zinc Oxide | 1314-13-2 | Anthropoids | 2 Different Species | Unknown | NOED ¹ | 14.6-1000 mg/kg dw |
| Zinc Oxide | 1314-13-2 | Terrestrial plants | 18 Different Species | Unknown | NOEC ³ | 32-5855 mg/kg dw |
| Zinc Oxide | 1314-13-2 | Micro-organisms | Unknown | Unknown | NOEC ¹ | 17-2623 mg/kg dw |
| Zinc Oxide | 1314-13-2 | Birds | | | | Not Relevant |

A basic assumption made in this hazard assessment and throughout this CSR, (in accordance to the same assumption made in the EU RA process) is that the ecotoxicity of zinc and zinc compounds is due to the Zn⁺⁺ion. As a consequence, all aquatic, sediment and terrestrial toxicity data in this report are expressed as "zinc", not as the test compound as such, because ionic zinc is considered to be the causative factor for toxicity. A further consequence of this is that all ecotoxicity data obtained on different zinc compounds, are mutually relevant for each other.

Terrestrial toxicity was not warranted on MAP and KCl.

¹ "LC50 /EC50" - (Median Lethal Concentration/Median Effective Concentration) They are the concentrations at which 50% mortality or inhibition of a function (e.g., growth or growth rate) was observed.

² "NOEC" - No Observed Effect Concentration. NOEC is the highest tested concentration for which there are no statistically significant difference of effect when compared to the control group.

³ "ECx" - It is the concentrations at which x % (10% for EC10) effect was observed or derived statistically when compared to the control group.

Reference: (ECHA, n.d.) & (Pubchem, search, n.d.)

12.2 Persistence and degradability

| | |
|----------------|-----------------------------------------------------------------------------------------------------------|
| Stability | : Non of the components hydrolyse nor is there evidence for photodegradation. |
| Biodegradation | Readily biodegradation study does not need to be conducted since the substance is metal/inorganic. |

Reference: (ECHA, n.d.)

12.3 Bioaccumulate potential

| | |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description | : The study does not need to be conducted as the substance as an inorganic salt has a low potential for adsorption. Due to homeostatic control mechanisms, bioaccumulation is not relevant to essential elements in general and to zinc in particular. |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Reference: (ECHA, n.d.)

12.4 Mobility in soil

Adsorption : **Simple inorganic salts with high aqueous solubility will exist in a dissociated form in an aqueous solution. Such a substance has a low potential for adsorption.**
For metals, adsorption/desorption translates in the distribution of the metals between the different fractions of the environmental compartment, e.g. the water (dissolved fraction, fraction bound to suspended matter), soil (fraction bound or complexed to the soil particles, fraction in the soil pore water,...). This distribution between the different compartments is translated in the partition coefficients between these different fractions. Study records on partition coefficients are given under 5.6.

Volatilization : **No data available**

Reference: (ECHA, n.d.)

12.5 Other adverse effects

Classification : **No data available**

SECTION 13: DISPOSAL CONSIDERATIONS

The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

SECTION 14: TRANSPORT INFORMATION

12.1 UN Modelled regulations

UN Number : **No classification**
UN proper shipping name : **No classification**
Transport hazard class(es) : **No classification**
Label : **No classification**
Packing group : **No classification**
Environmentally hazardous : **No classification**
Special precautions: : **ADR/RID¹ - Not classified**
 : **IMDG² - Not classified**
 : **IATA³ - Not classified**
Transport in Bulk according to IMO instructions : **Not specified**

Reference: (Hazmat Tool. n.d.) & (BAM. 2021)

¹ ADR/RID - International Carriage of Dangerous Goods by Rail (RID) and by Road (ADR)

² IMDG - The International Maritime Dangerous Goods (IMDG)

³ IATA - International Air Transport Association (IATA)

SECTION 15: REGULATORY INFORMATION

15.1 Safety, Health, and environmental regulations specific for the substance or mixture

| | |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Regulations | : This Safety Data Sheet conforms to the requirements set by the Department of Agriculture, Land reform and Rural development of the Republic of South Africa, United Nations GHS (Rev 9E) (2021) and SANS 10234:2019, on the 29 March 2022. |
| Restrictions | : The substance is not subjected to any prohibitions or restriction in South Africa. |
| Chemical Safety Assessment: | : For this product a chemical safety assessment was not carried out. |

SECTION 16: OTHER INFORMATION

16.1 Preparation and revision

Latest Version

| | |
|---------------------------|---------------------------------------------------------------|
| Version Number | : Ver. 3 |
| Preparation Date | : 25 August 2022 |
| Where the changes as made | : Complete overall of all data to comply with GHS regulations |

Previous Version

| | |
|------------------|-----------------|
| Version Number | : Ver. 2 |
| Preparation date | : February 2021 |

16.2 Abbreviations and Acronyms

| | |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GHS | : Globally Harmonized System of Classification and Labelling of Chemicals |
| ECHA | : European Chemical agency |
| AICIS | : The Australian Industrial Chemicals Introduction Scheme |
| EPA-NZ | : Environmental protection agency New Zealand |
| ILO (WHO) | : International labour organization (World health organization) |
| CAS Number | : CAS Number is a numerical designation for chemicals that is maintained by the Chemical Abstracts Service (CAS) of the American Chemical Society. |
| EC Number | : The European Community number (EC number) is a unique identifier that was assigned to substances for regulatory purposes within the European Union by the European Commission. |
| H-Statement | : Hazard Statement |
| P-Statement | : Precautionary Statements |
| Hazard Statements | : H319 - Causes serious eye irritation |
| Precautionary Statements | : P264 - Wash hands [and ...] thoroughly after handling. |
| | : P265 - Do not touch eyes. |
| | : P280 - Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... |
| N/A | : Not Applicable |
| Not Classified | : Data conclusive but not at sufficient levels for classification |
| PPE | : Personal precautions, protective equipment. |
| TWA | : Time Weighted Average |
| OEL | : Occupational Exposure Limits |
| STOT | : Specific target organ toxicity |
| LC50 / EC50 | : (Median Lethal Concentration/Median Effective Concentration): They are the concentrations at which 50% mortality or inhibition of a function (e.g., growth or growth rate) was observed. |
| NOEC | : (No Observed Effect Concentration) NOEC is the highest tested concentration for which there are no statistically significant difference of effect when compared to the control group |
| ECx | : It is the concentrations at which x % (10% for EC10) effect was observed or derived statistically when compared to the control group |
| LD0 | : Lethal Dose 0, represents the dose at which no individuals are expected to die. |
| LC0 | : Lethal concentration 0, represents the concentration at which no individuals are expected to die. |
| LDL0 | : Lethal dose low, is the lowest dosage of a compound that is introduced to the human body or that of an animal by any means apart from inhalation that will cause the death of the individual. |

16.3 References

BAM. (2021) Dangerous Goods Database. Retrieved From <https://www.dgg.bam.de/quickinfo/en/show/>

(The BAM offers with the expert portal TES information and service concerning the transport and packaging of dangerous substances and goods as well as explosives act)

BAUA. (2016). Technical Rule for Hazardous Substances. TRGS 510 Storage of hazardous substances in non-stationary containers. Retrieved from <https://www.baua.de/EN/Service/Legislative-texts-and-technical-rules/Rules/TRGS/>

(The German Federal Institute for Occupational Safety and Health offers selected publications in English. Baua's research aims to ensure a safe and healthy working environment that is adapted to the needs of humans.)

Environmental protection agency [EPA]. New Zealand Government. (n.d.) Database search. *Chemical Classification and Information Database (CCID)*. Retrieved from <https://www.epa.govt.nz/search/SearchForm?>

(EPA-Environmental protection agency. EPA is the government agency responsible for regulating activities that affect Aotearoa New Zealand's environment.)

European Chemicals Agency [ECHA]. (n.d.) Information on Chemicals. Retrieved from <https://echa.europa.eu/registration-dossier/-/registered-dossier/>

(ECHA - European Chemicals Agency. The European Chemicals Agency, is an agency of the EU. They implement the EU's chemicals legislation to protect your health and the environment. Their work also contributes to a well-functioning internal market, innovation, and the competitiveness of Europe's chemicals industry.)

Hazmat Tool. (n.d.) Load, Transport and Storage of Hazardous Materials according U.S-Hazardous Materials Regulations (49 CFR). Retrieved from <https://www.hazmattool.com/>

(Hazmat Tool is a free to search database with information regarding the 49CFR classification and transport)

International Labour organization [ILO]. (n.d.) ICSC database. *International Chemical Safety Cards (ICSCs)*. Retrieved from <https://www.ilo.org/dyn/icsc/>

(ILO-International Labour organization. ILO is a specialized agency of the United Nations. The database data was prepared by an international group of experts on behalf of ILO and WHO, with the financial assistance of the European Commission. © ILO and WHO 2021.)

OECD. (n.d.) The Global Portal to Information on Chemical Substances. Classification Search. Retrieved from <https://www.echemportal.org/echemportal/ghs-search/>

(OECD allow the search by chemical and provides a list and access to compiled SDS's)

Pubchem, search. (n.d.) Explore Chemistry. *Quickly find chemical information from authoritative sources*. Retrieved from <https://pubchem.ncbi.nlm.nih.gov/compound/>

(PubChem is an open chemistry database at the National Institutes of Health (NIH). Pubchem may reference some of the same sources as listed in this document)

Pubchem, GHS. (n.d.) Explore Chemistry. *GHS Classification*. Retrieved from <https://pubchem.ncbi.nlm.nih.gov/ghs/>

(PubChem is an open chemistry database at the National Institutes of Health (NIH). Pubchem may reference some of the same sources as listed in this document)

South African Labour Department. (2021) Regulations for Hazardous Chemical Agents. Retrieved from https://www.gov.za/sites/default/files/gcis_document/202103/44348rg11263gon280.pdf

(The Minister of Employment and Labour has, under section 43 of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993), after consultation with the Advisory Council for Occupational Health and Safety, made the regulations in the Schedule)

The Australian Industrial Chemicals Introduction Scheme [AICIS]. (n.d.) Chemical information. *Search assessments.*
Retrieved from <https://www.industrialchemicals.gov.au/chemical-information/search-assessments?assessmentcasnumber>

(The Australian Industrial Chemicals Introduction Scheme (AICIS) helps protect Australians and the environment by assessing the risks of industrial chemicals and providing information to promote their safe use. Focus mainly on health aspects.)

16.4 Disclaimer

The information contained in this SDS does not constitute a risk assessment, and should not replace the user's own assessment of risks as required by other health and safety legislation.

This SDS summarises at the date of issue our best knowledge of the health, safety and environmental hazard information related to the product and in particular how to safely handle, use, store and transport the product. Since Kynoch cannot anticipate or control the conditions under which the product may be handled, used, stored, or transported, each user must, prior to usage, review this SDS in the context of how the user intends to handle, use, store or transport the product and beyond, and communicate such information to all relevant parties.

We shall not assume any liability for the accuracy or completeness of the information contained herein or any advice given unless there has been gross negligence on our part.