KYNOCH FERTILIZER

SAFETY DATA SHEET

Opti Calitop LQ

Date Issued / Revised Date	:	*25 September 2022*
New version	:	*3.0*
Date previously revised	:	*1 February 2021*
Replaced version	:	*2.0*

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 GHS[1] product identification

Product Name : **Opti Calitop LQ**

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

1.2 Other means of identification

Description : **Liquid blend**

CAS Number : **Mixture**

EC Number [3] : **Mixture**

[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**

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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		No Classification		
Health Hazards		Serious eye damage/eye irritation	Category 1	H318
		Acute Tocicity, oral	Category 5	H303
Environmental Hazards		No classification		

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*

Composition	Description	CAS Number	Classification
0-10%	Ammonium Nitrate	6484-52-2	Oxid. Solid 3, Eye Damage 2A, Acute Tox. Oral Cat 5
0-50%	Urea	57-13-6	Eye Irritation, Cat 2A
0-10%	Ammonia	7664-41-7	Flam Gas2, Comp Gas, Acute tox inh 3, Skin Cor. 1B, Aqua short 1, Aqua Long 2
0-50%	Phosphoric Acid	7664-38-2	Cor. Metal 1, Acute Tox. Oral 4, Skin Cor. 1, Eye Damage 1
0-50%	Potassium Chloride	7447-40-7	No Classification
0-5%	Zinc Sulphate	7733-02-0	Acute Tox Cat4, Eye Damage 1, Aqua Short Cat1, Aqua Long Cat1
20-50%	Water		No Classification

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 :

Pictogram Name : **Corrosion**

Signal Word : **Danger**

Hazard Statements
H318 - Causes serious eye irritation
H303 - May be harmful if swallowed

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/...

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

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2.3 Other hazards that do not result in classification

Hazards : **Not Specified**

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	:	**Ammonium nitrate**
EC Name	:	**Ammonium nitrate**
Chemical Formula	:	**$H_3N.HNO_3$ / NH_4NO_3**
Molecular Weight	:	**80 g/mol**
Nutrient Content	:	**35% Total Nitrogen (N), 17.5% Ammonium (NH_4), 17.5% Nitrate (NO_3)**
CAS Number	:	**6484-52-2**
EC Number	:	**229-347-8**

Substance B:

Common name	:	**Urea Granular**
EC Name		**Carbamide**
Chemical Formula	:	**CH_4N_2O**
Molecular Weight	:	**60,05 g/mol**
Nutrient Content	:	**46% N**
CAS Number	:	**57-13-6**
EC Number	:	**200-315-5**

Substance C:

Common name	:	**Ammonia**
EC Name	:	**Ammonia, anhydrous**
Chemical Formula	:	**H3N**
Molecular Weight	:	**17.04 g/mol**
Nutrient Content	:	**82% Total Nitrogen (N)**
CAS Number	:	**7664-41-7**
EC Number	:	**231-635-3**

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Substance D:

Common name	:	**Phosphoric acid**
EC Name	:	**Orthophosphoric acid**
Chemical Formula	:	**H_3O_4P / H_3PO_4**
Molecular Weight	:	**89 g/mol**
Nutrient Content	:	**23% Phosphate (P)**
CAS Number	:	**7664-38-2**
EC Number	:	**231-633-2**
Impurities and stabilizers	:	**N/A**

Substance E:

Common name	:	**Potassium Chloride Granules**
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 F:

Common name	:	**Calcium Nitrate**
EC Name	:	**Nitric acid, ammonium calcium salt**
Chemical Formula	:	**$5Ca(NO_3)2NH_4NO_3.10H_2O$**
Molecular Weight	:	**1080.71 g/mol**
Nutrient Content	:	**15.5% Total Nitrogen (N), 14,4% Nitric Nitrogen (NO_3), 1,1% Ammoniacal Nitrogen (NH_4), 18.5-19% Calcium (Ca)**
CAS Number	:	**15245-12-2**
EC Number	:	**239-289-5**

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SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures

General information	:	**Not Specified.**
After inhalation	:	**If inhaled, remove to fresh air. Obtain medical attention if symptoms occur.**
After skin contact	:	**Rinse with plenty of running water. Remove contaminated clothing and shoes. Obtain medical attention if symptoms occur.**
After eye contact	:	**Rinse with plenty of running water. Obtain medical attention if symptoms occur.**
After swallowing	:	**Rinse out mouth. Make victim drink water (maximum of 2 drinking glasses). Do NOT induce vomiting. If symptoms persist consult doctor.**

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4.2 Most important symptoms and effects, both acute and delayed

Effects	:	**The substance is corrosive to the eyes, skin and respiratory tract. Corrosive on ingestion. Inhalation may cause asthma-like reactions (RADS). Exposure could cause asphyxiation due to swelling in the throat. Inhalation of high concentrations may cause lung oedema, but only after initial corrosive effects on the eyes and the upper respiratory tract have become manifest. Inhalation of high concentrations may cause pneumonitis.**		
Symptoms	:	**Inhalation**	-	**Cough. Sore throat. Burning sensation. Shortness of breath. Laboured breathing.**
	:	**Ingestion**	-	**Burns in mouth and throat. Burning sensation behind the breastbone. Abdominal pain. Vomiting. Shock or collapse.**
	:	**Skin contact**	-	**Redness. Pain. Blisters. Serious skin burns.**
	:	**Eye contact**	-	**Redness. Pain. Severe burns.**

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	:	**Put out the fire using appropriate agents against the surrounding fire.**
Inappropriate extinguishing media	:	**None**
Notes	:	**Use fire extinguishing methods suitable to surrounding conditions.**

5.2 Specific hazards arise from chemical

Warning	:	**The substance is a medium strong acid. Reacts violently with bases. The substance violently polymerizes under the influence of azo compounds and epoxides. On combustion, forms toxic fumes of phosphorus oxides. Decomposes on contact with alcohols, aldehydes, cyanides, ketones, phenols, esters, sulphides or halogenated organics. This produces toxic fumes. Attacks many metals. This produces flammable/explosive gas (hydrogen - see ICSC 0001).**
Hazardous Combustion Products	:	**Hydrogen gas is released in contact with most metals.**
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.**

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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	:	**Ventilate area and wash spill site after material pickup is complete. Throw sand, ashes or powder cement to absorb the liquid. Neutralise with slaked lime (calcium hydroxide), sodium carbonate, calcium carbonate or sodium bicarbonate. Place in container for disposal according to local / national regulations.**
Large Spill	:	**Ventilate area and wash spill site after material pickup is complete. Throw sand, ashes or powder cement to absorb the liquid. Neutralise with slaked lime (calcium hydroxide), sodium carbonate, calcium carbonate or sodium bicarbonate. Place in container for disposal according to local / national regulations.**

6.4 Reference to other sections

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

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SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

Handling	:	**Wash hands after use. Do not mix with bases. Do not eat, drink, smoke or use personal product when handling chemical substances. Prevent contact with eyes, skin or clothes. Use with adequate ventilation. Local exhaust ventilation should be provided.**
		Avoid possible sources of ignition (spark or flame). Avoid contamination by any source including metals, dust and organic materials.
	:	**For precautions see section 2.2.**

7.2 Conditions for safe storage, including any incompatibilities

Storerooms and receptacles	:	**Not Specified**
One common storage facility	:	**Dry. Well closed. Ventilation along the floor.**
	:	**Separated from food and feedstuffs and incompatible materials. See Chemical Dangers.**
	:	**Incompatible material: Stainless steel 316-L. High-density polyethylene. Glass.**
Handling of product	:	**Store in cool, dry, clean, well, ventilate areas away from alkalini products and metals. Do not store under direct sun light. Do not pile up the containers. Do not store at temperatures close to freezing point.**
Room conditions	:	**Dry. Well closed. Ventilation along the floor.**
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	Ammonium Nitrate	6484-52-2		Not Listed	Not Listed
	Urea	57-13-6		10 g/m^3	Not Listed
	Ammonia, anhydrous	7664-41-7		17mg/m^3 25 ppm	24 mg/m^3 35 ppm
	Phosphoric Acid	7664-38-2		8 mg/m^3	15 mg/m^3
	Potassium Chloride	7447-40-7		Not Listed	Not Listed
	Calcium Nitrate	15245-12-2		3 mg/m3	10mg/m3
	Water			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.)

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Routes of exposure	:	**Serious local effects by all routes of exposure.**
Inhalation risk	:	**A harmful contamination of the air will not or will only very slowly be reached on evaporation of this substance at 20°C.**
Effects of short-term exposure	:	**The substance is corrosive to the eyes, skin and respiratory tract. Corrosive on ingestion. Inhalation may cause asthma-like reactions (RADS). Exposure could cause asphyxiation due to swelling in the throat. Inhalation of high concentrations may cause lung oedema, but only after initial corrosive effects on the eyes and the upper respiratory tract have become manifest. Inhalation of high concentrations may cause pneumonitis.**
Effects of long-term or repeated exposure	:	**The substance may have effects on the upper respiratory tract and lungs. This may result in chronic inflammation and reduced lung function . Mists of this strong inorganic acid are carcinogenic to humans.**

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 Section7.

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**

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SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Properties

Physical state	:	**Solid** [1]
Composition	:	**Mixture** [2]
Colour	:	**Colourless**
Odour	:	**Odourless**
Melting point/freezing point	:	**170°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	:	**≥210 °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	:	**N/A**
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	:	**Exothermic reaction with water. Reacts violently with strong alkalis. In contact with reactive metals (as steel to carbon & aluminium) may produce hydrogen. At high temperature formation of phosphorous oxides.**
Chemical stability	:	**Stable under normal conditions**

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Hazardous Reactions	:	**The substance is a medium strong acid. Reacts violently with bases. The substance violently polymerizes under the influence of azo compounds and epoxides. On combustion, forms toxic fumes of phosphorus oxides. Decomposes on contact with alcohols, aldehydes, cyanides, ketones, phenols, esters, sulphides or halogenated organics. This produces toxic fumes. Attacks many metals. This produces flammable/explosive gas (hydrogen - see ICSC 0001).**
Conditions to Avoid	:	**High and low temperature.**
Incompatible Materials	:	**Incompatible material: Bases, metals, Stainless steel 316-L. High-density polyethylene. Glass.**
Hazardous Decomposition Products	:	**Hydrogen gas is released in contact with most metals.**

SECTION 11: TOXICOLOGY

11.1 Acute Toxicity

Classification	:	**Acute toxicity, oral Category 5**
Description	:	**Some substances are classified for Acute toxicity. The concentration of the hazardous substance is high enough for classification.**

Substance A:

Method	Compound	Cas Number	Measure	Value	Subject
Oral	Ammonium Nitrate	6484-52-2	LD50[1]	2950 mg/kg bw	Rat
Inhalation	Ammonium Nitrate	6484-52-2	LC50	>88.8 mg/L[2]	Rat
Dermal	Ammonium Nitrate	6484-52-2	LD50	>5000 mg/kg bw[2]	Rat

Substance B:

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 C:

Method	Compound	Cas Number	Measure	Value	Subject
Oral	Ammonia, anhydrous	7664-41-7	LD50[1]	350 mg/kg bw	Rat
Inhalation	Ammonia, anhydrous	7664-41-7	LC50	9850 mg/m³ air	Rat
Dermal	Ammonia, anhydrous	No Data			

Substance D:

Method	Compound	Cas Number	Measure	Value	Subject
Oral	Phosphoric Acid	7664-38-2	LD50[1]	2600 mg/kg bw[2]	Rat
Inhalation	Phosphoric Acid	7664-38-2	LC50	3846 mg/m³	Rat
			LC50	856 mg/m³	Mouse
			LC50	5337 mg/m³	Rabbit
			LC50	193 mg/m³	Guinea pig
Dermal	Phosphoric Acid	7664-38-2	LD50	>2000 mg/kg bw[2]	Rat

Substance E:

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 F:

Compound	Cas Number	Organism	Species	Time	Measure	Value
Calcium Nitrate	15245-12-2	Fish	Cyprinus Carpio (Carp)	48-h	LC50[1]	447 mg/L
Calcium Nitrate	15245-12-2	Aquatic invertebrates	Daphnia magna	48-h	EC50[3]	>100 mg/L
Calcium Nitrate	15245-12-2	Aquatic Algae and Cyanobacteria	Pseudokirchneriella subcapitata	72-h	EC50	>100 mg/L
Calcium Nitrate	15245-12-2	Micro-organisms	Activated sludge of a predominantly domestic sewage	3-h	EC50	>1000 mg/L

[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 : **No substance is classified.**

Subjects : **Humans, Rabbits**

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

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11.3 Serious eye damage/irritation

Classification	:	**Serious eye damage/eye irritation Category 1**
Description	:	**Some substances are classified. The concentration of the hazardous substance is high enough for the total mixture to be classified.**
Subjects	:	**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

Classification	:	**Not Classified**
Description	:	**None of the component was classified for reproductive toxicity.**
Subject	:	**Rat**

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

11.8 STOT [2] - single exposure

No data available

[2] *"STOT" - Specific target organ toxicity.*

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

11.9 STOT [2] - 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.)

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11.11 Route of Exposure and potential effects

Swallowing	:	**Burns in mouth and throat. Burning sensation behind the breastbone. Abdominal pain. Vomiting. Shock or collapse.**
Inhalation	:	**Cough. Sore throat. Burning sensation. Shortness of breath. Laboured breathing.**
Eye exposure	:	**Redness. Pain. Severe burns.**
Skin exposure	:	**Redness. Pain. Blisters. Serious skin burns.**

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 : **No Classification**

No substance is classified.

Aquatic Toxicity :

Substance A:

Compound	Cas Number	Organism	Species	Time	Measure	Value
Ammonium Nitrate	6484-52-2	Fish	Carp	48-h	LC50 [2]	447 mg/L
Ammonium Nitrate	6484-52-2	Aquatic invertebrates	Daphnia magna	48-h	EC50	490 mg/L
Ammonium Nitrate	6484-52-2	Aquatic invertebrates	Bullia digitalis	7D	EC50 [2]	555 mg/L
Ammonium Nitrate	6484-52-2	Aquatic Algae and Cyanobacteria	Benthic Diatoms	10-d	EC50	>1700 mg/L
Ammonium Nitrate	6484-52-2	Micro-organisms	Activated sludge of a predominantly domestic sewage	3-h	EC50 [2]	>1000 mg/L

Substance B:

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

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Substance C:

Compound	Cas Number	Organism	Species	Time	Measure	Value
Ammonia, anhydrous	7664-41-7	Fish	Fathead minnow	96-h	LC50[1]	34-109 mg/L
Ammonia, anhydrous	7664-41-7	Aquatic invertebrates	Daphnia magna	48-h	LC50	101 mg/L
Ammonia, anhydrous	7664-41-7	Aquatic Algae and Cyanobacteria	Chlorella vulgaris	18-d	EC50	2700 mg/L
Ammonia, anhydrous	7664-41-7	Micro-organisms	Testing not relevant			

Substance D:

Compound	Cas Number	Organism	Species	Time	Measure	Value
Phosphoric Acid	7664-38-2	Fish	No data available		[1]	
Phosphoric Acid	7664-38-2	Aquatic invertebrates	Daphnia magna	48-h	EC50	100 mg/L
Phosphoric Acid	7664-38-2	Aquatic Algae and Cyanobacteria	green alga	72-h	EC50[2]	100 mg/L
Phosphoric Acid	7664-38-2	Micro-organisms	Activated sludge of a predominantly domestic sewage	3-h	EC50[2]	>1000 mg/L

Substance E:

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 F:

Compound	Cas Number	Organism	Species	Time	Measure	Value
Zinc Sulphate	7733-02-0	Fish	Oncorrhynchus Mykiss	UN	LC50[1][3]	0.169 mg/L
Zinc Sulphate	7733-02-0	Fish	7 species	UN	EC10	0.044 mg/L
Zinc Sulphate	7733-02-0	Aquatic invertebrates	Ceriodapnia dubia	UN	EC50[1]	0.147 mg/L
Zinc Sulphate	7733-02-0	Aquatic invertebrates	13 species	UN	EC10[3]	0.037 mg/L
Zinc Sulphate	7733-02-0	Aquatic Algae and Cyanobacteria	Scenedesmus subspicatus	72-h	EC10[3]	0.06 mg/L
Zinc Sulphate	7733-02-0	Microorganisms	-	3-h	EC50[1]	0.01 mg/L

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Terrestrial Toxicity :

Only the substances that was justified for testing is listed below.

Substance B:

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]	160 mg/kg soil dw
Urea	57-13-6	Anthropoids	Collembola, Mites, bees	36-w	NOED[2]	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

[2]

[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 : **No data available**

Biodegradation **Readily biodegradation study does not need to be conducted since the substance is inorganic.**

Reference: (ECHA, n.d.)

12.3 Bioaccumulate potential

Description : **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 bioaccumulation.**

Reference: (ECHA, n.d.)

12.4 Mobility in soil

Adsorption : **No data available**

Volatilization : **No data available**

Reference: (ECHA, n.d.)

12.5 Other adverse effects

Classification : **No data available**

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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/RID - No classification**
		IMDG - No classification
		IATA - No classification
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.**

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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.*
LDLo	:	*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.)

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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. There 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 49CRF 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 heath aspects.)

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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.