SAFETY DATA SHEET

1. Identification

GHS product identifier	**KAS Liquid Urease Inhibitor 26.7%**
Other means of identification	
Product code	KAS_LiquidUrea267_ZA_EN
Recommended use	Fertilizer Additive.
Recommended restrictions	None known.
Manufacturer information	
Manufacturer	Koch Agronomic Services, LLC 4111 E 37th St N Wichita, KS 67220 US kochmsds@kochind.com 1.866.863.5550
1.4. Emergency telephone number	Call CHEMTREC day or night USA/Canada - 1.800.424.9300 Outside USA/Canada -1.703.527.3887 (Please reverse charges)

2. Hazard(s) identification

Physical hazards	Not classified.	
Health hazards	Skin corrosion/irritation	Category 2
	Serious eye damage/eye irritation	Category 1
	Reproductive toxicity	Category 1B
	Specific target organ toxicity following single exposure	Category 3 respiratory tract irritation
Environmental hazards	Not classified.	

Label elements

Signal word	Danger
Hazard statement	Causes skin irritation. Causes serious eye damage. May cause respiratory irritation. May damage fertility or the unborn child.
Precautionary statement	
Prevention	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid breathing mist or vapour. Wash thoroughly after handling. Use only outdoors or in a well-ventilated area. Wear eye protection/face protection. Wear protective gloves. Use personal protective equipment as required.
Response	IF ON SKIN: Wash with plenty of soap and water. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTRE or doctor/physician. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash before reuse.
Storage	Store in a well-ventilated place. Keep container tightly closed. Store locked up.
Disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.
Other hazards which do not result in classification	None known.
Supplemental information	None.

3. Composition/information on ingredients

Mixtures

Hazardous components

Chemical name	CAS number	%
N-(n-butyl)-thiophosphoric triamide	94317-64-3	15 - 40
N-methyl-2-pyrrolidone	872-50-4	10 - 30

Non-hazardous components

Chemical name	CAS number	%
Propane -1,2-diol	57-55-6	40 - 70
Non-hazardous components	Proprietary	< 6

Composition comments All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.
This Safety Data Sheet is not a guarantee of product specification or NPK value(s). NPK content is on specified sales orders, customer invoices, or product specification sheets obtained from supplier.

4. First-aid measures

Inhalation Move person to fresh air. If the affected person is not breathing, apply artificial respiration. Get medical attention immediately.

Skin contact Immediately flush skin with plenty of water. Get medical attention if irritation develops and persists.

Eye contact Immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.

Ingestion Rinse mouth thoroughly. Drink 1 or 2 glasses of water. Do not induce vomiting without advice from poison control center. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Get medical attention.

Most important symptoms/effects, acute and delayed Risk of serious damage to eyes. Skin irritation. Respiratory tract irritation.

Indication of immediate medical attention and special treatment needed Treat symptomatically. Symptoms may be delayed.

General information Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire-fighting measures

Suitable extinguishing media Water fog. Water spray. Carbon dioxide (CO2). Foam.

Unsuitable extinguishing media Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical Fire may produce irritating, corrosive and/or toxic gases.

Special protective equipment and precautions for firefighters Selection of respiratory protection for firefighting: follow the general fire precautions indicated in the workplace. Self-contained breathing apparatus and full protective clothing should be worn when fighting chemical fires.

Fire fighting equipment/instructions Use standard firefighting procedures and consider the hazards of other involved materials.

General fire hazards The product is not flammable.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures Avoid inhalation of vapours and spray mist and contact with skin and eyes. Ensure adequate ventilation. Wear suitable protective clothing. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Absorb in vermiculite, dry sand or earth and place into containers. After removal flush contaminated area thoroughly with water.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use. For waste disposal, see Section 13 of the SDS.

Environmental precautions Prevent further leakage or spillage if safe to do so. Do not contaminate water. Do not allow to enter drains, sewers or watercourses.

7. Handling and storage

Precautions for safe handling Avoid inhalation of vapours/spray and contact with skin and eyes. Use only with adequate ventilation. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities Keep container tightly closed. Store in a cool, dry, well-ventilated place. Store away from incompatible materials. Long term storage at temperatures above 36°C (100°F), and long term storage of opened containers, will cause the product to degrade. As the product degrades it can release harmful gases. Store below 36°C (100°F) and use opened containers within 30 days. Always use oldest first.

8. Exposure controls/personal protection

Occupational exposure limits

South Africa. Recommended Exposure Limits (RELs) Regulations for Hazardous Chemical Substances, Table 2

Components	Type	Value	Form
N-methyl-2-pyrrolidone (CAS 872-50-4)	TWA	400 mg/m3	
		100 ppm	
Propane -1,2-diol (CAS 57-55-6)	TWA	470 mg/m3	Total vapour and particulates.
		10 mg/m3	Particulate.
		150 ppm	Total vapour and particulates.

Biological limit values No biological exposure limits noted for the ingredient(s).

Exposure guidelines Follow standard monitoring procedures.

Appropriate engineering controls Provide adequate general and local exhaust ventilation. Observe Occupational Exposure Limits and minimize the risk of inhalation of vapors and spray mist. Provide eyewash station and safety shower.

Individual protection measures, such as personal protective equipment

Eye/face protection Chemical goggles are recommended.

Skin protection

Hand protection Chemical resistant gloves are recommended. Be aware that the liquid may penetrate the gloves. Frequent change is advisable. Suitable gloves can be recommended by the glove supplier.

Other Wear appropriate clothing to prevent repeated or prolonged skin contact.

Respiratory protection If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. Wear air supplied respiratory protection if exposure concentrations are unknown. In case of inadequate ventilation or risk of inhalation of mist, use suitable respiratory equipment with particle filter.

Thermal hazards Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Handle in accordance with good industrial hygiene and safety practices.

9. Physical and chemical properties

Appearance

Physical state Liquid.

Form Liquid.

Colour Green.

Odour Ammonia-like.

Odour threshold 0.1 ppm

pH Not available.

Melting point/freezing point Not available.

Initial boiling point and boiling range Not available.

Flash point 81.1 °C (178.0 °F)

Evaporation rate Not available.

Flammability (solid, gas) Not applicable.

Upper/lower flammability or explosive limits

Flammability limit - lower (%) Not applicable.

Flammability limit - upper (%) Not applicable.

Vapour pressure Not available.

Vapour density Not available.

Relative density	1.07
Solubility(ies)	
Solubility (water)	Soluble
Partition coefficient (n-octanol/water)	Log Pow = 0.444
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Not available.
Other information	
Explosive properties	Not explosive.
Flammability	Does not support combustion at 187°F / 86.1°C.
Oxidising properties	Not oxidising.

10. Stability and reactivity

Reactivity	The product is non-reactive under normal conditions of use, storage and transport.
Chemical stability	Stable under normal temperature conditions.
Possibility of hazardous reactions	Hazardous polymerisation does not occur.
Conditions to avoid	Extreme temperatures.
Incompatible materials	Acids. Strong reducing agents. Strong oxidising agents.
Hazardous decomposition products	During combustion: Carbon oxides. Nitrogen oxides. Sulphur oxides.

11. Toxicological information

Information on likely routes of exposure

Inhalation	May cause respiratory irritation.
Skin contact	Causes skin irritation.
Eye contact	Causes serious eye damage.
Ingestion	May cause discomfort if swallowed.
Symptoms related to the physical, chemical and toxicological characteristics	Risk of serious damage to eyes. Skin irritation. Respiratory tract irritation.

Information on toxicological effects

Acute toxicity May cause discomfort if swallowed.

Components	Species	Test Results
N-(n-butyl)-thiophosphoric triamide (CAS 94317-64-3)		
Acute		
Dermal		
LD50	Rabbit	> 2000 mg/kg
Inhalation		
LC50	Wistar rat	> 2.1 mg/l, 4 hours
Oral		
LD50	Wistar rat	> 2000 mg/kg
N-methyl-2-pyrrolidone (CAS 872-50-4)		
Acute		
Dermal		
LD50	Rat	> 5000 mg/kg
Inhalation		
Mist		
LC50	Rat	> 5.1 mg/l, 4 hours
Oral		
LD50	Rat	4150 mg/kg

Components	Species	Test Results
Propane -1,2-diol (CAS 57-55-6)		
Acute		
Dermal		
LD50	Rabbit	20800 mg/kg
Oral		
LD50	Rat	22000 mg/kg

Skin corrosion/irritation Causes skin irritation.

Irritation Corrosion - Skin

N-methyl-2-pyrrolidone (CAS 872-50-4)	Result: Slightly irritating Species: Rabbit

Serious eye damage/eye irritation Causes serious eye damage.

Eye

N-methyl-2-pyrrolidone (CAS 872-50-4)	Result: Moderately irritating Species: Rabbit Observation Period: 14 days

Respiratory or skin sensitisation

Respiratory sensitisation Not a respiratory sensitiser.

Skin sensitisation Not a skin sensitiser.

Germ cell mutagenicity No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity This product is not classified as a carcinogen.

Reproductive toxicity May damage fertility or the unborn child.

Specific target organ toxicity - single exposure May cause respiratory irritation.

Specific target organ toxicity - repeated exposure No data available.

Aspiration hazard Not classified.

Chronic effects Prolonged exposure may cause chronic effects.

Further information No other specific acute or chronic health impact noted.

12. Ecological information

Ecotoxicity The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Components		Species	Test Results
N-(n-butyl)-thiophosphoric triamide (CAS 94317-64-3)			
Aquatic			
Algae	EC50	Selenastrum capricornutum	280 mg/l, 96 hours
Crustacea	EC50	Daphnia magna	290 mg/l, 48 hours
	LC50	Daphnia	350 mg/l, 48 hours
Fish	LC50	Lepomis macrochirus	1140 mg/l, 96 hours
N-methyl-2-pyrrolidone (CAS 872-50-4)			
Aquatic			
Acute			
Algae	ErC10	Desmodesmus subspicatus	92.6 mg/l, 96 hours
	ErC50	Desmodesmus subspicatus	600.5 mg/l, 72 hours
Chronic			
Crustacea	NOEC	Daphnia magna	12.5 mg/l, 21 days

Persistence and degradability The product is readily biodegradable.

Bioaccumulative potential

Partition coefficient n-octanol / water (log Kow)

N-methyl-2-pyrrolidone (CAS 872-50-4)	-0.38
Propane -1,2-diol (CAS 57-55-6)	-0.92

Mobility in soil This product is water soluble and may disperse in soil.

Other adverse effects	No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.
Local disposal regulations	Dispose in accordance with all applicable regulations.
Waste from residues / unused products	Dispose of in accordance with all applicable regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner.
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

ADR

Not regulated as dangerous goods.

RID

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not established.

15. Regulatory information

Safety, health and environmental regulations specific for the product in question

Hazardous Substances Act, 1973 (Act No. 15 of 1973)

Not listed.

International regulations

Stockholm Convention

Not applicable.

Rotterdam Convention

Not applicable.

Montreal Protocol

Not applicable.

Kyoto Protocol

Not applicable.

Basel Convention

Not applicable.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Industrial Chemicals (AICIS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	No
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	No
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	No
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	No
Taiwan	Taiwan Chemical Substance Inventory (TCSI)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information

Issue date	04-May-2021
Revision date	-
Version No.	01
List of abbreviations	EC50: Effective Concentration, 50%. LC50: Lethal Concentration, 50%. LD50: Lethal Dose, 50%. TWA: Time weighted average.
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