SAFETY DATA SHEET

1. Identification

Product identifier **Nitrain™ Nitrogen Stabilizer**

Other means of identification

Synonyms Nitrain is a registered trademark of Loveland Products, Inc.

SDS Number Nutrien Ag Solutions_Nitrain_AU_EN

Recommended use of the chemical and restrictions on use

Recommended use Fertilizer Coating.

Restrictions on use Not available.

Details of manufacturer or importer

Manufacturer/Supplier

Distributed by: Nutrien Ag Solutions Limited
Level 5, Building A, 26 Talavera Road,
Macquarie Park, NSW 2113. Tel: (02) 9889 5400
Product Support Tel: 1800 44 88 92

Emergency

FOR SPECIALIST ADVICE
IN AN EMERGENCY DIAL
1800 033 111
24 HOURS AUSTRALIA WIDE

2. Hazard(s) identification

Classification of the hazardous chemical

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

Label elements, including precautionary statements

Hazard symbol(s)

Corrosion | Health hazard | Exclamation mark

Signal word Danger

Hazard statement(s) Causes skin irritation. Causes serious eye damage. May cause respiratory irritation. May damage fertility or the unborn child.

Precautionary statement(s)

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 protective gloves/protective clothing/eye protection/face protection.

Response	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 ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing and wash before reuse. If skin irritation occurs: Get medical advice/attention. IF exposed or concerned: Get medical advice/attention. Specific treatment (see this label).
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.
Supplemental information	Restricted to professional users.
Other hazards which do not result in classification	None known.

3. Composition/information on ingredients

Mixture

Identity of chemical ingredients	CAS number and other unique identifiers	Concentration of ingredients
Propane -1,2-diol	57-55-6	40 - 70
N-(n-butyl)-thiophosphoric triamide	94317-64-3	15 - 40
N-methyl-2-pyrrolidone	872-50-4	10 - 30
Non-hazardous components	Proprietary	1 - 5

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

Description of necessary 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. For advice, contact a Poisons Information Centre (Phone e.g. Australia 13 1126; New Zealand 0800 764 766) or a doctor (at once).
Personal protection for first-aid responders	Keep victim warm. Keep victim under observation. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.
Symptoms caused by exposure	Risk of serious damage to eyes. Contact may produce eye irritation with associated redness, swelling, tears and pain. Skin irritation. Respiratory tract irritation.
Medical attention and special treatment	Treat symptomatically. The effects might be delayed.

5. Fire-fighting measures

Extinguishing media

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 fire fighters	Self-contained breathing apparatus and full protective clothing should be worn when fighting chemical fires. Selection of respiratory protection for firefighting: follow the general fire precautions indicated in the workplace.
Fire fighting equipment/instructions	Use standard firefighting procedures and consider the hazards of other involved materials. Move containers from fire area if you can do so without risk.

Hazchem code	None.
General fire hazards	The product is not flammable. Will burn if involved in a fire.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Keep upwind. Keep out of low areas. Ventilate closed spaces before entering them.
For emergency responders	Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Keep upwind. Keep out of low areas. Ventilate closed spaces before entering them. Keep unnecessary personnel away.
Environmental precautions	Prevent further leakage or spillage if safe to do so. Do not contaminate water.
Methods and materials for containment and cleaning up	The product is soluble in water. Large Spills: Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water. Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination. Never return spills in original containers for re-use. For waste disposal, see section 13 of the SDS.
Other issues relating to spills and releases	Clean surface thoroughly to remove residual contamination.

7. Handling and storage

Precautions for safe handling	Avoid exposure - obtain special instructions before use. Do not breathe mist or vapour. Wear personal protective equipment. Do not use in areas without adequate ventilation. Avoid prolonged exposure. Wash thoroughly after handling. Do not empty into drains. Handle and open container with care. Use care in handling/storage. Wash before eating, drinking and/or smoking.
Conditions for safe storage, including any incompatibilities	Avoid exposure - obtain special instructions before use. Store in a well-ventilated place. Store in original tightly closed container. Keep away from food, drink and animal feeding stuffs. Use care in handling/storage. Store in accordance with local/regional/national/international regulation. Keep out of reach of children. 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 and personal protection

Control parameters Follow standard monitoring procedures.

Occupational exposure limits

Australia. National Workplace OELs (Workplace Exposure Standards for Airborne Contaminants, Appendix A)

Components	Type	Value	Form
N-methyl-2-pyrrolidone (CAS 872-50-4)	STEL	309 mg/m3	
		75 ppm	
	TWA	103 mg/m3	
		25 ppm	
Propane -1,2-diol (CAS 57-55-6)	TWA	474 mg/m3	Total vapour and particulates.
		10 mg/m3	Particulate.
		150 ppm	Total vapour and particulates.

UK. EH40 Workplace Exposure Limits (WELs)

Components	Type	Value	Form
N-methyl-2-pyrrolidone (CAS 872-50-4)	STEL	80 mg/m3	
		20 ppm	
	TWA	40 mg/m3	
		10 ppm	

UK. EH40 Workplace Exposure Limits (WELs)

Components	Type	Value	Form
Propane -1,2-diol (CAS 57-55-6)	TWA	474 mg/m3	Total vapour and particulates.
		10 mg/m3	Particulate.
		150 ppm	Total vapour and particulates.

Germany. DFG MAK List (advisory OELs). Commission for the Investigation of Health Hazards of Chemical Compounds in the Work Area (DFG)

Components	Type	Value	Form
N-methyl-2-pyrrolidone (CAS 872-50-4)	TWA	82 mg/m3	Vapour and aerosol.
		20 ppm	Vapour and aerosol.

Biological limit values

Germany. TRGS 903, BAT List (Biological Limit Values)

Components	Value	Determinant	Specimen	Sampling Time
N-methyl-2-pyrrolidone (CAS 872-50-4)	150 mg/l	5-Hydroxy-N-methyl-2-pyrrolidon	Urine	*

* - For sampling details, please see the source document.

ACGIH Biological Exposure Indices

Components	Value	Determinant	Specimen	Sampling Time
N-methyl-2-pyrrolidone (CAS 872-50-4)	100 mg/l	5-Hydroxy-N-methyl-2-pyrrolidone	Urine	*

* - For sampling details, please see the source document.

Exposure guidelines Follow standard monitoring procedures.

Appropriate engineering controls Provide adequate general and local exhaust ventilation. Provide eyewash station.

Individual protection measures, for example personal protective equipment (PPE)

Eye/face protection Chemical goggles are recommended.

Skin protection

Hand protection Neoprene gloves are recommended. Be aware that the liquid may penetrate the gloves. Frequent change is advisable.

Other Chemical resistant clothing is recommended. Routinely wash work clothing and protective equipment to remove contaminants.

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. In case of inadequate ventilation or risk of inhalation of vapours, use suitable respiratory equipment. Wear air supplied respiratory protection if exposure concentrations are unknown.

Thermal hazards Wear appropriate thermal protective clothing, when necessary.

Hygiene measures Wash hands after handling. 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.

9. Physical and chemical properties

Appearance Red liquid.

Physical state Liquid.

Form Liquid.

Colour Red.

Odour Ammonia-like.

Odour threshold 0.1 ppm

pH 8 - 9.5

Melting point/freezing point Not available.

Initial boiling point and boiling range	Not available.
Flash point	178.0 °F (81.1 °C)
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 physical and chemical parameters	
Explosive properties	Not explosive.
Flammability	Does not support combustion at 86.1°C / 187°F
Oxidising properties	Not oxidising.

10. Stability and reactivity

Reactivity	The product is stable and 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 possible routes of exposure

Inhalation	May cause respiratory irritation.
Skin contact	Causes skin irritation. May be absorbed through the skin.
Eye contact	Causes serious eye damage.
Ingestion	Ingestion may cause severe irritation of the mouth, the oesophagus and the gastrointestinal tract.
Symptoms related to exposure	Risk of serious damage to eyes. Skin irritation. Respiratory tract irritation.
Acute toxicity	May cause severe irritation or burns to the eyes, skin, gastrointestinal tract, and respiratory system.

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

Components	Species	Test Results
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	3605 mg/kg
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.

Serious eye damage/irritation Causes serious eye damage.

Respiratory or skin sensitisation

Respiratory sensitisation Not classified.

Skin sensitisation Not classified as a sensitiser.

Germ cell mutagenicity Not classified.

Carcinogenicity Not classified.

Reproductive toxicity May damage fertility or the unborn child.

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

Specific target organ toxicity - repeated exposure Not classified.

Aspiration hazard Not classified.

Chronic effects Prolonged exposure may cause chronic effects.

Other information N-Methyl-2-pyrrolidone: The effects might be delayed. May adversely affect the liver and kidney based on animal testing

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	EC50	Scenedesmus subspicatus	> 500 mg/l, 72 Hours
Crustacea	EC50	Daphnia magna	> 1000 mg/l, 24 Hours
Fish	LC50	Oncorhynchus mykiss	> 500 mg/l, 96 Hours

Components		Species	Test Results
Chronic			
Crustacea	NOEC	Daphnia magna	12.5 mg/l, 21 days

Persistence and degradability The product is not readily biodegradable.

Bioaccumulative potential

Partition coefficient n-octanol / water (log Kow) Log Pow = 0.444

N-methyl-2-pyrrolidone (CAS 872-50-4)	-0.54
Propane -1,2-diol (CAS 57-55-6)	-0.92

Mobility in soil The product is soluble in water.

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 methods Do not discharge into drains or water courses.

Residual waste Dispose in accordance with all applicable regulations.

Contaminated packaging Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport information

ADG

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

National regulations This Safety Data Sheet was prepared in accordance with Australia Model Code of Practice for the preparation of Safety Data Sheets for Hazardous Chemicals (25/05/2018).

Australia Medicines & Poisons Appendix A

Poisons schedule number not allocated.

Australia Medicines & Poisons Appendix B

Propane -1,2-diol (CAS 57-55-6)

Australia Medicines & Poisons Appendix D

Poisons schedule number not allocated.

Australia Medicines & Poisons Appendix E

N-methyl-2-pyrrolidone (CAS 872-50-4)

Australia Medicines & Poisons Appendix F

Poisons schedule number not allocated.

Australia Medicines & Poisons Appendix G

Poisons schedule number not allocated.

Australia Medicines & Poisons Appendix H

Poisons schedule number not allocated.

Australia Medicines & Poisons Appendix I

Poisons schedule number not allocated.

Australia Medicines & Poisons Appendix J

Poisons schedule number not allocated.

Australia Medicines & Poisons Appendix K

Poisons schedule number not allocated.

Australia Medicines & Poisons Schedule 10

Poisons schedule number not allocated.

Australia Medicines & Poisons Schedule 2

Poisons schedule number not allocated.

Australia Medicines & Poisons Schedule 3

Poisons schedule number not allocated.

Australia Medicines & Poisons Schedule 4

Poisons schedule number not allocated.

Australia Medicines & Poisons Schedule 5

N-methyl-2-pyrrolidone (CAS 872-50-4)

Australia Medicines & Poisons Schedule 6

N-methyl-2-pyrrolidone (CAS 872-50-4)

Australia Medicines & Poisons Schedule 7

Poisons schedule number not allocated.

Australia Medicines & Poisons Schedule 8

Poisons schedule number not allocated.

Australia Medicines & Poisons Schedule 9

Poisons schedule number not allocated.

High Volume Industrial Chemicals (HVIC)

Propane -1,2-diol (CAS 57-55-6)	10000 - 99999 TONNES See the regulation for additional information.

Importation of Ozone Deleting Substances (Customs(Prohibited imports) Regulations 1956, Schedule 10)

Not listed.

National Pollutant Inventory (NPI) substance reporting list

Not listed.

Prohibited Carcinogenic Substances

Not regulated.

Prohibited Substances (National Model Regulation for the control of Workplace Hazardous Substances, Schedule 2 NOHSC:1005 (1994) as amended)

Not listed.

Resricted Importation of Organochlorine Chemicals (Customs(Prohibited Imports) Regulations 1956, Schedule 9)

Not listed.

Restricted Carcinogenic Substances

Not regulated.

International regulations

Stockholm Convention

Not applicable.

Rotterdam Convention

Not applicable.

Kyoto Protocol

Not applicable.

Montreal Protocol

Not applicable.

Basel Convention

Not applicable.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	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

Country(s) or region	Inventory name	On inventory (yes/no)*
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
Taiwan	Taiwan Chemical Substance Inventory (TCSI)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates this product complies 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 30-September-2022

Revision date -

Key abbreviations or acronyms used

LD50: Lethal Dose, 50%.
LC50: Lethal Concentration, 50%.

References

ECHA CHEM
Workplace Threshold Quantities of Hazardous Chemicals

Disclaimer

NOTICE: The information contained in this document is based on data considered to be accurate as of the preparation date of this Safety Data Sheet (SDS) and was prepared pursuant to applicable Government regulation(s). This SDS may not be used as a commercial specification sheet of manufacturer or seller, and no warranty or representation, expressed or implied, is made as to the accuracy or comprehensiveness of the above data and safety information, nor is any authorization given or implied to practice any patented invention without a license. Additional information may be needed to evaluate other uses of the product, including use of the product in combination with any materials or in any processes other than those specifically referenced. Information provided about any hazards that may be associated with the product is not meant to suggest that use of the product in a given application will necessarily result in any exposure or risk to workers or the general public. Purchasers and users of the product are responsible for determining that this product is suitable for the intended use and application. No responsibility can be assumed by vendor for any damage or injury resulting from failure to adhere to recommended uses, or from any hazards inherent to the product. Purchasers and users assume all risk of use, storage and handling of the product in compliance with applicable federal, state and local laws and regulations. Purchasers and users of the product should explicitly advise their employees, agents, contractors and customers who will use the product of this SDS.