



Limus Nitrogen Stabiliser

SECTION 1: SUBSTANCE/PREPARATION AND MANUFACTURER/SUPPLIER IDENTIFICATION

Product name: Limus

Recommended use: Liquid Nitrogen Stabiliser

Manufacturer/supplier: Tanuki Pty Ltd
27 Heinemann Road
Wellcamp QLD 4350
+61 7 4639 2009

Emergency information: CHEMTREC, 24 hours, +61 2 9037 2994, CCN 1026237
CHEMTREC, 24 hours, 1800 862 115 (Toll-free), CCN 1026237

SECTION 2: HAZARD IDENTIFICATION

Classification of the substance and mixture:

Acute toxicity: Cat.4 (oral)

Serious eye irritation: Cat.2

Reproductive toxicity: Cat.2 (fertility)

Label elements and precautionary statement:

Pictogram:



Signal Word: Warning

Hazard Statement: H319 Causes serious eye irritation.
H302 Harmful if swallowed.
H361 Suspected of damaging fertility.

Precautionary Statement: P101 If medical advice is needed, have product container or label at hand.
P102 Keep out of reach of children.
P103 Read carefully and follow instructions.





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Precautionary Statements (Prevention):	P280 Wear protective gloves, protective clothing and eye protection or face protection. P201 Obtain special instructions before use. P202 Do not handle until all safety precautions have been read and understood. P270 Do not eat, drink or smoke when using this product. P264 Wash contaminated body parts thoroughly after handling.
Precautionary Statements (Response):	P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P301 +P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. P330 Rinse mouth. P308 + P313 IF exposed or concerned: Get medical advice/attention. P337 + P313 If eye irritation persists: Get medical attention.
Precautionary Statements (Storage):	P405 Store locked up.
Precautionary Statements (Disposal):	P501 Dispose of contents and container to hazardous or special waste collection point.
Hazard determining component (s) for labelling:	N-butylphosphorothioic triamide (NBPT), N-propylphosphorothioic triamide (NPPT).
Other hazards which do not result in classification:	Contains N-butylphosphorothioic triamide (NBPT), the repeated administration of high dose levels is suspected to cause reduction of Cholinesterase activity.



SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature

Substance nature: mixture

Liquid material - fertilizers, Soluble concentrate (SL)

Hazardous Ingredients

N-butylphosphorothioic triamide (NBPT)	Content (W/V):	21%
	Acute Tox.:	Cat. 5 (oral)
	CAS Number:	94317-64-3
	Eye Dam./Irrit:	Cat. 1
	Repr.:	Cat. 2 (fertility)
N-propylphosphorothioic triamide (NPPT)	Content (W/V):	7%
	CAS Number:	916809-14-8
	Eye Irrit.:	Cat. 2B
	Repr.:	Cat. 2 (fertility)
Diethylene glycol	Content (W/V):	70%
	Acute Tox.:	Cat. 4 (oral)
	CAS Number:	111-46-6

SECTION 4: FIRST-AID MEASURES

General advice:	First aid personnel should pay attention to their own safety. If the patient is likely to become unconscious, place and transport in stable sideways position (recovery position). Remove contaminated clothing. If difficulties occur: Seek medical attention. Show container, label and/or safety data sheet to physician. Avoid contact with the skin, eyes and clothing.
If inhaled:	Keep patient calm, remove to fresh air, seek medical attention.
On skin contact:	After contact with skin, wash immediately with plenty of water and soap. If irritation develops, seek medical attention.
On contact with eyes:	Immediately wash affected eyes for at least 15 minutes under running water with eyelids held open, consult an eye specialist.





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On ingestion:	Immediately rinse mouth and then drink 200-300 ml of water, seek medical attention.
Note to physician:	Symptoms: Information, i.e. additional information on symptoms and effects may be included in the GHS labelling phrases available in Section 2 and in the Toxicological assessments available in Section 11., (Further) symptoms and/or effects are not known so far Treatment: Treat according to symptoms (decontamination, vital functions), no known specific antidote.

SECTION 5: FIRE-FIGHTING MEASURES

Suitable extinguishing

media:	Water spray, carbon dioxide, foam, dry powder
Specific hazards:	Carbon monoxide, carbon dioxide, nitrogen oxides, hydrogen chloride, phosphorus compounds, halogenated compounds, sulfur oxides The substances/groups of substances mentioned can be released in case of fire.
Special protective equipment:	Wear self-contained breathing apparatus and chemical-protective clothing.
Further information	In case of fire and/or explosion do not breathe fumes. Keep containers cool by spraying with water if exposed to fire. Collect contaminated extinguishing water separately, do not allow to reach sewage or effluent systems. Dispose of fire debris and contaminated extinguishing water in accordance with official regulations

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions:	Do not breathe vapour/spray. Use personal protective clothing. Avoid contact with the skin, eyes and clothing. Remove contaminated clothes, undergarments and shoes immediately. Information regarding personal protective measures, see section 8.
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Environmental precautions:	Do not discharge into the subsoil/soil. Do not discharge into drains/surface waters/groundwater.
Methods for cleaning up or taking up:	For small amounts: Pick up with suitable appliance and dispose of. Pick up with suitable absorbent material (e.g. sand, sawdust, general-purpose binder, kieselguhr). For large amounts: Dike spillage. Pump off product. Cleaning operations should be carried out only while wearing breathing apparatus. Dispose of absorbed material in accordance with regulations. Collect waste in suitable containers, which can be labeled and sealed. Clean contaminated floors and objects thoroughly with water and detergents, observing environmental regulations.

SECTION 7: HANDLING AND STORAGE

Handling	Handle in accordance with good industrial hygiene and safety practice. No special measures necessary if stored and handled correctly. Ensure thorough ventilation of stores and work areas. When using do not eat, drink or smoke. Hands and /or face should be washed before breaks and end of shift. Protection against fire and explosion: No special precautions necessary. The substance/product is non-combustible. Product is not explosive.
Storage	Segregate from foods and animal feeds.
Storage stability:	Shelf life of Limus when stored between -5 °C and 40 °C is 2 years.
Further information on storage conditions:	Protect against moisture. Keep away from heat. Protect from direct sunlight.



SECTION 8: EXPOSURE CONTROL AND PERSONAL PROTECTION

Components with occupational exposure limits: Diethylene glycol, 111-46-6;
TWA value 100 mg/m³; 23 ppm (AU NOEL)

Personal Protective Equipment

Respiratory protection: Suitable respiratory protection for lower concentrations or short-term effect: Combination filter for gases/vapours of organic, inorganic, acid inorganic, alkaline compounds and toxic particles (e. g. EN14387 Type ABEK-P3)

Hand protection: Suitable chemical resistant safety gloves (EN ISO 374-1) also with prolonged, direct contact
(Recommended: Protective index 6, corresponding > 480 minutes of permeation time according to EN ISO 374-1): E.g. nitrile rubber (0.4 mm), chloroprene rubber (0.5 mm), butyl rubber (0.7 mm) etc.

Eye protection: Tightly fitting safety goggles (splash goggles) (e.g. EN 166)

Body protection: Body protection must be chosen depending on activity and possible exposure, e.g. apron, protecting boots, chemical-protection suit (according to EN 14605 in case of splashes or EN ISO 13982 in case of dust).

General safety and hygiene measures: Handle in accordance with good industrial hygiene and safety practice. Avoid contact with the skin, eyes and clothing. Wearing of closed work clothing is recommended. Keep away from food, drink and animal feeding stuffs. No eating, drinking, smoking or tobacco use at the place of work. Hands and/or face should be washed before breaks and at the end of the shift. Remove contaminated clothing immediately and dispose of safely.





SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Form:	Liquid
Colour:	Yellow
Odour:	Ammonia like
Odour threshold:	Not determined due to potential health hazard by inhalation.
pH value:	Approx. 7.5 – 9.5
Melting point:	The product has not been tested.
Boiling point:	The product has not been tested.
Flash point:	Approx 130 °C. No flash point – measurement made up to the indicated temperature, pilot light extinguishes.
Evaporation rate:	No data available.
Flammability (solid/gas):	Not flammable.
Lower explosion limit:	As a result of our experience with this product and our knowledge of its composition we do not expect any hazard as long as the product is used appropriately and in accordance with the intended use.
Upper explosion limit:	As a result of our experience with this product and our knowledge of its composition we do not expect any hazard as long as the product is used appropriately and in accordance with the intended use.
Ignition temperature:	Approx 301°C
Thermal decomposition:	204°C, 128 kJ/kg (onset temperature) Not a substance liable to self-decomposition according to UN transport regulations, class 4.1.
Vapour pressure:	The product has not been tested.
Density:	Approx. 1.14 g/cm ³ (20 °C)
Relative vapour density (air):	Not determined.
Solubility in water:	Soluble



Partitioning coefficient n-octanol/water (log Pow):	The statements are based on the properties of the individual components.
Information on:	N-butylphosphorothioic triamide (NBPT)
Partitioning coefficient n-octanol/water (log Pow):	0.444
Information on:	(20 °C; pH value: approx. 7) (OECD Guideline 107)
Partitioning coefficient n-octanol/water (log Pow):	N-propylphosphorothioic triamide (NPPT)
Information on:	< 0.3
Partitioning coefficient n-octanol/water (log Pow):	(24 °C) (OECD Guideline 117)
Viscosity, dynamic:	Approx 74mPa.s
	(20 °C) .
	Approx 25 mPa.s
	(40 °C)
Viscosity, kinematic:	Approx 22mm ² /s
	(40°C).
	(calculated (from dynamic viscosity))
Particle characteristics	Particle size distribution: The substance / product is marketed or used in a non-solid or granular form.

SECTION 10: STABILITY AND REACTIVITY

Conditions to avoid:	See SDS section 7 - Handling and storage.
Thermal decomposition:	204 °C. 128kJ/kg (onset temperature) Not a substance liable to self-decomposition according to UN transport regulations, class 4.1.
Substances to avoid:	Strong acids, strong bases, strong oxidizing agents.
Hazardous reactions:	No hazardous reactions if stored and handled as prescribed / indicated.
Hazardous decomposition products:	No hazardous decomposition products if stored and handled as prescribed / indicated.
Chemical stability:	The product is stable if stored and handled as prescribed/indicated.
Reactivity:	No hazardous reactions if stored and handled as prescribed/indicated.



SECTION 11: TOXICOLOGICAL INFORMATION

Routes of exposure

Acute oral toxicity	Experimental/calculated data: LD50rat (oral): 838 mg/kg (OCED Guideline 423)
Acute inhalation toxicity	Experimental /calculated data: LC50 rat (by inhalation): > 2.1mg/l 4 h (OECD Guideline 403) Tested as dust aerosol.
Acute dermal toxicity	LD50rat (dermal): > 5,000 mg/kg (OECD Guideline 402) No mortality was observed.
Assessment of acute toxicity	Of moderate toxicity after single ingestion. Virtually nontoxic by inhalation. Virtually nontoxic after a single skin contact. The product has not been tested. The statement has been derived from the substances / products of a similar structure or composition. Information on: N-butylphosphorothioic triamide (NBPT)
Symptoms	Information, i.e. additional information on symptoms and effects may be included in the GHS labelling phrases available in Section 2 and in the Toxicological assessments available in Section 11. (Further) symptoms and / or effects are not known so far
Irritation	Assessment of irritating effects: Eye contact causes irritation. Not irritating to the skin. The product has not been tested. The statement has been derived from substances / products of similar structure or composition. Experimental / calculated data: Skin corrosion / irritation: non-irritant (OCED Guideline 439) Skin corrosion / irritation; non-irritant (OCED Guideline 431) Skin corrosion / irritation rabbit: irritant (OCED Guideline 404) Serious eye damage / irritation: irritant (OCED Guideline 492) Serious eye damage/irritation rabbit: irritant (OECD Guideline 405)



**Respiratory/Skin
sensitization**

Assessment of sensitisation:

No sensitising effect. The product has not been tested. The statement has been derived from the properties of the individual components.

Information on: N-butylphosphorothioic triamide (NBPT)

Experimental/calculated data:

Guinea pig maximization test guinea pig: non-sensitising.

Information on: N-propylphosphorothioic triamide (NPPT)

Experimental /calculated data:

Mouse Local Lymph Node Assay (LLNA) mouse: Non sensitising. (OECD Guidelines 429). The product has not been tested. The statement has been derived from substances/products of a similar structure or composition. Analogous: Assessment derived from products with similar chemical character.

**Germ cell
mutagenicity**

Assessment of mutagenicity:

Mutagenicity tests revealed no genotoxic potential. The product has not been tested. The statement has been derived from the properties of the individual components.

Carcinogenicity

Assessment of carcinogenicity:

The results of various animal studies gave no indication of a carcinogenic effect. The product has not been tested. The statement has been derived from the properties of the individual components.

**Reproductive
toxicity**

Assessment of reproduction toxicity:

The product has not been tested. The statement has been derived from the properties of the individual components.

Information on: N-butylphosphorothioic triamide (NBPT)

Assessment of reproduction toxicity:

The results of animal studies suggest a fertility impairing effect.

Information on: N-propylphosphorothioic triamide (NPPT)

Assessment of reproduction toxicity:

The potential to impair fertility cannot be excluded. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.



Developmental toxicity	Assessment of teratogenicity: Animal studies gave no indication of a development toxic effect at doses that were not toxic to the parental animals. The product has not been tested. The statement has been derived from the properties of the individual components.
Specific target organ toxicity (single exposure)	Based on the available information there is no specific target organ toxicity to be expected after a single exposure. Remarks: The product has not been tested. The statement has been derived from the properties of the individual components.
Repeated dose toxicity and Specific target organ toxicity (repeated exposure)	Assessment of repeated dose toxicity: The product has not been tested. The statement has been derived from the properties of the individual components. Information on: N-butylphosphorothioic triamide (NBPT) Assessment of repeated dose toxicity: The substance may cause damage to the liver after repeated ingestion of high doses, as shown in animal studies. The substance may cause damage to the kidney after repeated ingestion of high doses, as shown in animal studies. Information on: Diethylene glycol Assessment of repeated dose toxicity: The substance may cause damage to the kidney after repeated ingestion of high doses, as shown in animal studies. The substance may cause damage to the liver after repeated ingestion of high doses, as shown in animal studies. The effects were only observed at doses/concentrations not relevant for classification and/or practical use conditions. These effects are not relevant to humans at occupational levels of exposure.
Aspiration hazard	Not applicable.
Other relevant toxicity information	Misuse can be harmful to health.



SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity

Assessment of aquatic toxicity:

There is a high probability that the product is not acutely harmful to aquatic organisms. The product has not been tested. The statement has been derived from the properties of the individual components.

Information on: N-butylphosphorothioic triamide (NBPT)

Toxicity to fish:

LC50 (96 h) 1,140 mg/l, *Lepomis macrochirus* (OPPTS 820.1075 (EPA-Guideline), static)

The details of the toxic effect relate to the nominal concentration.

Information on: N-propylphosphorothioic triamide (NPPT)

Toxicity to fish:

LC50 (96 h) > 120 mg/l, *Danio rerio* (OECD Guideline 203, static)

Nominal concentration.

Analogous: Assessment derived from products with similar chemical character.

Information on: Diethylene glycol

Toxicity to fish:

LC50 (96 h) 75,200 mg/l, *Pimephales promelas* (Fish test acute, Flow through.)

The statement of the toxic effect relates to the analytically determined concentration.

Information on: N-butylphosphorothioic triamide (NBPT)

Aquatic invertebrates:

EC50 (48 h) 290 mg/l, *Daphnia magna* (OECD Guideline 202, part 1, static)

The details of the toxic effect relate to the nominal concentration.

Information on: N-propylphosphorothioic triamide (NPPT)

Aquatic invertebrates:

EC50 (48 h) >= 120 mg/l, *Daphnia magna* (OECD Guideline 202, part 1, static)

Nominal concentration.

Analogous: Assessment derived from products with similar chemical character.





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Information on: Diethylene glycol

Aquatic invertebrates:

EC50 (48 h) 62,630 mg/l, Daphnia magna (other, static)

Information on: N-butylphosphorothioic triamide (NBPT)

Aquatic plants:

EC50 (72 h) 280 mg/l, Scenedesmus subspicatus (OECD Guideline 201, static)

The details of the toxic effect relate to the nominal concentration.

No observed effect concentration (72 h) 75 mg/l, Scenedesmus subspicatus (OECD Guideline 201, static)

The details of the toxic effect relate to the nominal concentration.

Information on: N-propylphosphorothioic triamide (NPPT)

Aquatic plants:

No observed effect concentration (72 h) ≥ 120 mg/l (growth rate), Desmodesmus subspicatus (OECD Guideline 201, static)

Nominal concentration.

Analogous: Assessment derived from products with similar chemical character.

Information on: Diethylene glycol

Aquatic plants:

No observed effect concentration (72 h) > 100 mg/l (growth rate), Scenedesmus quadricauda (Algal growth inhibition test, static)

The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Information on: Diethylene glycol

Chronic toxicity to fish:

LC50 (28 d) $> 1,500$ mg/l, Menidia peninsulae (OPP 72-4 (EPA Guideline), Flow through.)

The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.



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Information on: Diethylene glycol

Chronic toxicity to aquatic invertebrates:

No observed effect concentration (7 d), 8,590 mg/l, Ceriodaphnia dubia (Daphnia test chronic, semistatic)

The product has not been tested. The statement has been derived from substances/products of a similar structure or composition. The details of the toxic effect relate to the nominal concentration.

Mobility

Assessment transport between environmental compartments:

Adsorption in soil: The product has not been tested. The statement has been derived from the properties of the individual components.

Information on: N-butylphosphorothioic triamide (NBPT)

Assessment transport between environmental compartments:

The substance will slowly evaporate into the atmosphere from the water surface.

Adsorption to solid soil phase is not expected.

Information on: N-propylphosphorothioic triamide (NPPT)

Assessment transport between environmental compartments:

The substance will not evaporate into the atmosphere from the water surface.

Adsorption to solid soil phase is not expected.

Information on: Diethylene glycol

Assessment transport between environmental compartments:

The substance will not evaporate into the atmosphere from the water surface.

Adsorption to solid soil phase is not expected.





Persistence and degradability

Assessment biodegradation and elimination (H₂O):

The product has not been tested. The statement has been derived from the properties of the individual components.

Information on: N-butylphosphorothioic triamide (NBPT)

Assessment biodegradation and elimination (H₂O):

Not readily biodegradable (by OECD criteria).

Information on: N-propylphosphorothioic triamide (NPPT)

Assessment biodegradation and elimination (H₂O):

Readily biodegradable (according to OECD criteria).

Bioaccumulation potential

Assessment bioaccumulation potential:

The product has not been tested. The statement has been derived from the properties of the individual components.

Information on: N-butylphosphorothioic triamide (NBPT)

Assessment bioaccumulation potential:

Because of the n-octanol/water distribution coefficient (log Pow) accumulation in organisms is not to be expected.

Information on: N-propylphosphorothioic triamide (NPPT)

Assessment bioaccumulation potential:

Because of the n-octanol/water distribution coefficient (log Pow) accumulation in organisms is not to be expected.

Information on: Diethylene glycol

Assessment bioaccumulation potential:

Because of the n-octanol/water distribution coefficient (log Pow) accumulation in organisms is not to be expected.





Additional information

Other ecotoxicological advice:

Do not discharge product into the environment without control.

SECTION 13: DISPOSAL CONSIDERATIONS

Must be disposed of or incinerated in accordance with local regulations.

Contaminated packaging: Contaminated packaging should be emptied as far as possible and disposed of in the same manner as the substance/product.

SECTION 14: TRANSPORT INFORMATION

Domestic transport: Not classified as a dangerous good under transport regulations
UN number or ID number Not applicable
UN proper shipping name: Not applicable
Transport hazard class(es): Not applicable
Packing group: Not applicable
Environmental hazards: Not applicable
Special precautions for user None known

Sea transport IMDG
Not classified as a dangerous good under transport regulations
UN number or ID number: Not applicable
UN proper shipping name: Not applicable
Transport hazard class(es): Not applicable
Packing group: Not applicable
Environmental hazards: Not applicable
Marine pollutant: no
Special precautions for user None known

Air transport IATA/ICAO
Not classified as a dangerous good under transport regulations
UN number or ID number Not applicable
Proper shipping name: Not applicable
Transport hazard class(es): Not applicable
Packing group: Not applicable
Environmental hazards: Not applicable
Special precautions for user None known





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Maritime transport in bulk according to IMO instruments

Maritime transport in bulk is not intended.

SECTION 15: REGULATORY INFORMATION

Other regulations

If other regulatory information applies that is not already provided elsewhere in this safety data sheet, then it is described in this subsection.

Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP): Schedule 6

Registration status:

AICIS, AU

Contains categorised (according to AICIS scheme), non-listed substance., Can be purchased domestically from Tanuki.

SECTION 16: OTHER INFORMATION

This product is of industrial quality and unless specified or agreed intended exclusively for industrial use.

Any other intended applications should be discussed with the manufacturer.

The data contained in this safety data sheet are based on our current knowledge and experience and describe the product only with regard to safety requirements. This safety data sheet is neither a Certificate of Analysis (CoA) nor technical data sheet and shall not be mistaken for a specification agreement. Identified used in this safety data sheet do neither represent an agreement on the corresponding contractual quality of the substance/mixture nor a contractually designated use. It is the responsibility of the recipient of the product to ensure any proprietary rights and existing laws and legislation are observed.



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