



# MATERIAL SAFETY DATA SHEET



## Ammonium Nitrate

ABN: 81 008 668 371

### Section 1 – Identification of the Material and Supplier

<b>Product Name</b> Ammonium nitrate		
<b>Other names</b> LDAN, TGAN, EGAN, porous prill. Company product code 1825.		
<b>Recommended use</b> Production of explosives and fertiliser manufacture.		
<b>Company name</b> CSBP Limited		
<b>Address</b> Kwinana Beach Road, KWINANA	<b>State</b> Western Australia	<b>Postcode</b> 6167
<b>Telephone number</b> (08) 9411 8777 (Australia), +61 8 9411 8777 (Overseas)	<b>Emergency telephone number</b> 1800 093 333 (Australia), +61 8 9411 8444	

### Section 2 – Hazard Identification

<b>Hazard Classification, including a statement of overall hazardous nature</b> <b>HAZARDOUS SUBSTANCE.</b> Ammonium nitrate is not classified as hazardous and is not specified in the NOHSC List of Designated Hazardous Substances [NOHSC:10005(1999)]. <b>DANGEROUS GOODS.</b> Ammonium nitrate is classified for physicochemical hazards and specified as dangerous in the Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG Code), 7 <sup>th</sup> Edition, (FORS, 2007).	
<b>Risk Phrases</b> Ammonium nitrate is classified as an oxidizing agent. R22 Harmful if swallowed R31 Contact with acid liberates toxic gas R36 Irritating to eyes	
<b>Safety Phrases</b> Ammonium nitrate is classified as dangerous goods. S14/S15 Keep away from heat, sources of ignition – No smoking, combustible material S21 When using do not smoke S29 Do not empty into drains S41 In case of fire and /or explosion do not breathe fumes S50 Do not mix with minerals acids, chlorine, oxidizing agents, alkalis, diesel, oils and greases. S56 Dispose of this material and its container to hazardous or special waste collection point S57 Use appropriate containment to avoid environmental contamination S59 Refer to manufacturer for information on recovery/recycling S60 This material and its container must be disposed of as hazardous waste	
<b>Poison Schedule</b> Ammonium nitrate is not listed as a poison in the Standard for the Uniform Scheduling of Drugs and Poisons.	

### Section 3 – Composition/Information on Ingredients

<b>Chemical identity of ingredients</b> Ammonium nitrate Moisture and additives	<b>Proportion of ingredients</b> 99 % (wt/wt) Remainder	<b>CAS Number for ingredients</b> 6484 -52-2
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## Ammonium Nitrate

### Section 4 – First Aid Measures

#### First Aid

Ammonium nitrate is moderately toxic if large amounts are swallowed. If more than a small quantity has been swallowed seek medical attention. Training on handling ammonium nitrate incidents using this MSDS should be provided before any ammonium nitrate handling or use commences.

#### **First Aid Facilities**

First aid procedures, equipment, medication and training for the treatment of injury by ammonium nitrate should be in place BEFORE the use commences.

Equipment in place should be:

- Safety shower and eyewash stations immediately accessible in the workplace;
- Eye-wash bottle;
- Fresh, clean cool drinking water;
- Oxygen;
- “Space” or thermal blankets for treating patients for shock;
- Personal protective equipment for use by first aid personnel.

#### **FIRST AID PROCEDURES FOR DEALING WITH THIS PRODUCT AND EXPOSURE TO IT**

##### **1. Personal Protection By First Aid Personnel**

First aid personnel providing first aid treatment to a patient injured by ammonium nitrate should observe the following precautions for their own personal protection:

- Avoid contact with ammonium nitrate by wearing protective gloves;
- Wear chemical goggles to prevent ammonium nitrate particles entering eyes;
- Wear P2 type canister respirator if rescue area is contaminated by airborne ammonium nitrate dust.

##### **2. Swallowed**

If person is conscious, rinse mouth thoroughly with water immediately and give water or milk to drink. DO NOT induce vomiting. Seek medical assistance if more than a small quantity has been swallowed, when relevant symptoms occur after swallowing.

##### **3. Eyes**

Immediately irrigate with copious quantities of water, while holding eyelids open, for at least 15 minutes. Seek medical attention if irritation persists.

##### **4. Skin**

Wash affected areas with copious amounts of water. Remove all contaminated clothing and launder before re-use.

##### **5. Inhalation**

Remove affected person from exposure to a well ventilated area. Keep warm and at rest. In emergency, if breathing is difficult give oxygen. If the affected person suffers cardiac arrest commence cardio-pulmonary resuscitation immediately. Seek urgent medical attention.

#### **ADVICE TO DOCTOR.**

**This product contains nitrates, which may be reduced to nitrites by intestinal bacteria. Nitrites may affect the blood (methaemoglobinaemia) and blood vessels (vasodilation and a fall in blood pressure). Effects peak within 30 minutes. Clinical signs of cyanosis appear before other symptoms because of the dark pigmentation of methaemoglobin. Institute cardiac monitoring, especially in patients with coronary, artery or pulmonary disease.**

#### **Long Term Complications**

**No long term complications are known.**

Further information about the treatment for exposure to this product can be obtained from the Poisons Information Centre on (08) 13 1126 (Australia only)



ABN: 81 008 668 371

# MATERIAL SAFETY DATA SHEET

## Ammonium Nitrate



### Section 5 – Fire Fighting Measures

#### Product flammability

Ammonium nitrate is not flammable under normal applications and is not considered a fire risk, but will support combustion in an existing fire by liberating oxygen – even if smothered. It is for this reason that fires involving ammonium nitrate cannot be extinguished by the prevention or air ingress (for example, smouldering with steam) because of the *in situ* provision of oxygen from the ammonium nitrate itself. Thermal decomposition may result in toxic gases, such as oxides of nitrogen and ammonia, being produced.

#### Suitable extinguishing media

Extinguish fires with large amounts of water.

#### Hazard from combustion products

Fire will cause ammonium nitrate to decompose giving off fumes of nitrogen oxides and ammonia.

#### Special protective precautions and equipment for fire fighters

Wear full protective clothing, including respiratory protection.

Inert chemical absorbent and substantial amounts of water will be required to clean up a large spill.

Portable showers and eyewash may also be needed.

Prevent run-off into drains and waterways.

#### Hazchem Code

1Z

### Section 6 – Accidental Release Measures

#### Emergency procedures

Hazardous conditions may result if an ammonium nitrate spill is managed improperly. Make plans in advance to handle possible emergencies, including obtaining stocks of inert absorbent materials, to avoid both human and environmental exposure. Always wear recommended personal protective equipment and respiratory protection.

#### Methods and Materials for containment and clean up

For all spills, evacuate unprotected personnel upwind and out of danger. Remove sources of heat and ignition. Restrict access to spill site. Any spillage should be contained and recovered. Do not allow to mix with sawdust and other combustible organic substances.

#### Small Leaks

If possible contain the area of the spill, sweep into a clean labelled open container and recycle.

#### Large Spills

If possible contain the area of the spill. A front end loader may be required to scoop up spill into a clean container. Depending on the degree and nature of contamination, dispose of by use as fertilizer on farm or authorised waste facility.

Wash down area and prevent run-off into drains, sewers or waterways. Soak up wet material using absorbent material such as vermiculite or sand and dispose at authorised waste facility.



## Ammonium Nitrate

ABN: 81 008 668 371

### Section 7 – Handling and Storage

#### Precautions for safe handling

Regulated dangerous goods as Oxidizing Agent Class 5-1.

Avoid excessive generation of dust. Avoid contamination by combustible (e.g., diesel oil, grease, etc.) and incompatible materials, which may cause fires. Avoid unnecessary exposure to the atmosphere to prevent moisture pick up, which makes the material difficult to handle. When handling ammonium nitrate over long periods use appropriate personal protective equipment, e.g., gloves.

#### Conditions for safe storage, including any incompatibilities

Store in accordance with Australian Standard AS 4326 *The storage and handling of oxidizing agents*. Store away from sources of heat or fire, especially in a confined space – the heating may cause an explosion. Keep away from combustible materials and substances mentioned in *Precautions for safe handling* section above. Avoid storage and contamination with chlorine bleaches, pool chlorine and hypochlorites as a reaction, leading to the formation of explosive nitrogen trichloride, may occur. Dry ammonium nitrate has been reported to detonate in fires with dry ammonium sulfate. Ensure that ammonium nitrate fertiliser is not stored near hay, straw, grain, diesel oil, greases, etc., as these are incompatibles and may cause fires. Do not permit smoking and the use of naked lights in the storage area for ammonium nitrate. Restrict stack size for bagged product (according to local regulations). Any building used for the storage of ammonium nitrate should be dry and well ventilated. Where the nature of the bagged product and climatic conditions so require, store under conditions that will avoid breakdown by thermal cycling (wide variation in temperature). The product should not be stored in direct sunlight to avoid physical breakdown due to thermal cycling.

### Section 8 – Exposure Controls/Personal Protection

#### National exposure standards

ES-TWA		ES-STEL		ES-Peak	
No data available	10 mg/m <sup>3</sup>	No data available	No data available	No data available	No data available

#### Biological limit values

No data available.

#### Engineering controls

Avoid high dust concentration and provide ventilation where necessary.

#### Personal protective equipment

Personal protective equipment (PPE) should be used where other control measures are not practicable or adequate to control exposure. It should be chosen to prevent routine exposure and to protect workers in the case of accidental contact with ammonium nitrate.

Eye/face protection: Wear chemical safety glasses to prevent eye contact.

Skin protection: Wear PVC gloves when handling the product to prevent contact. Wear long trouser and long sleeves to prevent contact.

Respiratory protection: Use P2 type canister respirator where dust is a problem.

Personal hygiene: Change and wash clothing and PPE, if contaminated, or before storing and/or re-using.

Wash hands and face thoroughly after handling and before work breaks, eating, drinking, smoking and using toilet facilities.

## Ammonium Nitrate

### Section 9 – Physical and Chemical Properties

#### Appearance (colour, physical form, shape)

White odourless prills, with strong disagreeable acrid taste.

#### Odour

Odourless

#### pH

pH of 10% solution: > 4.5

#### Vapour pressure

Ammonium nitrate does not exert significant vapour pressure.

#### Vapour density

Not applicable.

#### Boiling point/range

Decomposes from 170 °C before boiling.

#### Freezing/melting point

170 °C.

#### Solubility

Solubility in water: 118.3 g/100g of water at 0 °C; slightly soluble in alcohol; not soluble in acetone.

#### Specific gravity or density

Typical Bulk Density: 755 ± 25 kg/m<sup>3</sup> (refer to contract for specification).

#### Flash point and method of detecting flash point

Ammonium nitrate does not give off flammable vapours.

#### Upper and lower flammable (explosive) limits in air

Ammonium nitrate is not flammable.

#### Ignition temperature

Not applicable.

#### Viscosity

Not applicable.

### Section 10 – Stability and Reactivity

#### Chemical stability

When stored and handled in accordance with Australian Standard AS 4326 *The storage and handling of oxidizing agents*, ammonium nitrate remains stable.

#### Conditions to avoid

Store away from sources of heat or fire, especially in a confined space. Keep away from combustible materials and organic substances. Avoid storage and contamination with chlorine bleaches, pool chlorine and hypochlorites. Dry ammonium nitrate has been reported to detonate in fires with dry ammonium sulfate. Ensure that ammonium nitrate fertiliser is not stored near hay, straw, grain, diesel oil, greases. Do not permit smoking and the use of naked lights in the storage area for ammonium nitrate. Restrict stack size for bagged product (according to local regulations). Any building used for the storage of ammonium nitrate should be dry and well ventilated. Where the nature of the bagged product and climatic conditions so require, store under conditions that will avoid breakdown by thermal cycling (wide variation in temperature). The product should not be stored in direct sunlight to avoid physical breakdown due to thermal cycling. Avoid excessive generation of dust. Avoid contamination by combustible (e.g., diesel oil, grease, etc.) and incompatible materials. Avoid unnecessary exposure to the atmosphere to prevent moisture pick up.

#### Incompatible materials

Ammonium nitrate is incompatible with copper, zinc, or their alloys (i.e., bronze, brass, galvanised metals, etc.), aluminium powder and mild steel.

## Ammonium Nitrate

ABN: 81 008 668 371

### Hazardous decomposition products

When heated to decomposition (unconfined) ammonium nitrate produces nitrous oxides, white ammonium nitrate fumes and water.

### Hazardous reactions

Contamination of ammonium nitrate with chlorine bleaches, pool chlorine and hypochlorites may result in the formation of explosive nitrogen trichloride. Dry ammonium nitrate has been reported to detonate in fires with dry ammonium sulfate. When mixed with strong acid ammonium nitrate produces toxic brown nitrogen dioxide gas. When molten, ammonium nitrate may decompose due to shock or pressure. Ammonium nitrate may react violently with nitrites, chlorates, chlorides and permanganates.

## Section 11 – Toxicological Information

### HEALTH EFFECTS

When handled in accordance with the guidelines in this material safety data sheet, ammonium nitrate should not present any health effects. If this product is mishandled, symptoms that may arise are:

#### **Acute:**

Ammonium nitrate has moderate toxicity if swallowed. It is not classified as hazardous according to criteria of WorkSafe Australia.

#### Inhalation:

High mist concentration of air-borne material may cause irritation to the nose and upper respiratory tract, symptoms may include coughing and sore throat. Prolonged exposure may be harmful.

#### Skin:

Prolonged contact may cause some irritation, including redness and itching.

#### Eye:

May cause irritation, redness and pain following contact due to abrasive nature of material.

#### Swallowed:

Presents moderate toxicity, unless large amounts are ingested. Large amounts give large to gastro-intestinal irritation, with symptoms such as nausea, vomiting and diarrhoea. Large amounts may also cause dilation of blood vessels by direct smooth muscle relaxation and methaemoglobinaemia (excessive conversion of haemoglobin to methaemoglobin, which is incapable of binding and carrying oxygen – methaemoglobin is formed when iron in the haem molecule is oxidised from the ferrous to the ferric state). Symptoms include dizziness, abdominal pain, vomiting, bloody diarrhoea, weakness, convulsions and collapse. LD<sub>50</sub> (Oral, rat) = 2,217 mg/kg.

#### **Chronic:**

Prolonged or repeated exposure may cause drying of the skin with cracking and irritation that may lead to dermatitis.

## Section 12 – Ecological Information

### Ecotoxicity

Ammonium nitrate is a plant nutrient and large contamination may kill vegetation and cause poisoning in livestock and poultry.

Ammonium nitrate is of low toxicity to aquatic life and spills may cause algal blooms in static waters.

### Persistence and degradability

When released into the soil, ammonium nitrate is not expected to evaporate significantly, but is expected to leach into groundwater. In damp soil the ammonium ion, NH<sub>4</sub><sup>+</sup>, is adsorbed by the soil. When released into water, ammonium nitrate is expected to readily biodegrade; the nitrate ion, NO<sub>3</sub><sup>-</sup>, is mobile in water. The nitrate ion is the predominant form of plant nutrition. It follows the natural nitrification/denitrification cycle to give nitrogen.

### Mobility

Very soluble in water. The NO<sub>3</sub><sup>-</sup> ion is mobile. The NH<sub>4</sub><sup>+</sup> ion is adsorbed by the soil.



## Ammonium Nitrate

ABN: 81 008 668 371

### Environmental fate (exposure)

Low toxicity to aquatic life. TL<sub>m</sub> 96 between 10 – 100 ppm.

No effects on growth or feeding activities were observed in largemouth bass and channel catfish exposed to concentration of 400 mg NO<sub>3</sub>/L.

### Acute Toxicity to Fish

48 hr LC<sub>50</sub> (*Cyprinus carpio*): 1.15 - 1.72 mg un-ionised NH<sub>3</sub>/L; 95 – 102 mg total NH<sub>3</sub>/L;

96 hr LC<sub>50</sub> (Chinook Salmon, rainbow trout, bluegill): 420 -1,360 mg NO<sub>3</sub>/L;

TL<sub>m</sub> (Tadpoles): 910 mg NH<sub>3</sub>/L.

### Chronic Toxicity to Fish

7 day LC<sub>50</sub> (Fingerling rainbow trout): 1,065 mg/L.

### Acute Toxicity to Aquatic Invertebrates

EC<sub>50</sub> (*Daphnia magna*): 555 mg/L; 124.9 mg total NH<sub>3</sub>/L.

### Chronic Toxicity to Invertebrates

Up to 7 days NOEC (*Bullia digitalis*): 300 mg/L.

### Bioaccumulative potential

Ammonium nitrate does not show any bio-accumulation phenomena.

## Section 13 – Disposal Considerations

### Disposal methods and containers

Refer to local State Land Waste Management Authority. Depending on degree and nature of contamination, dispose of by use as fertiliser on farm or to authorised waste facility. Empty containers (bulka bags) must be decontaminated by rinsing thoroughly with water. Rinsing water needs to be disposed of carefully. Avoid contaminating waterways.

### Special precautions for landfill or incineration

No data available.

## Section 14 – Transport Information

### UN Number

1942

### UN Proper shipping name

Ammonium Nitrate

### Class and subsidiary risk

5.1 Oxidizing Agent

### Packing group

III

### Special precautions for user

Not to be loaded with explosives (Class 1), flammable gases (Class 3), toxic gases (class 2.3), Flammable liquids (Class 3), flammable solids (Class 4.1), spontaneous combustible substances (Class 4.2), dangerous when wet substances (Class 4.3), organic peroxides (Class 5.2), toxic substances, where the toxic substances are fire risk substances (Class 6), radioactive substances (Class 7), corrosives (Class 8), miscellaneous dangerous goods, where the miscellaneous dangerous goods are fire risk substances (Class 9), and fire risk substances other than dangerous goods; however, exemptions apply.

### Hazchem code

1Z



## Ammonium Nitrate

ABN: 81 008 668 371

### Section 15 – Regulatory Information

#### Australian regulatory information

Ammonium nitrate is not classified as hazardous and is not specified in the NOHSC List of Designated Hazardous Substances [NOHSC:10005(1999)].

Ammonium nitrate is not listed as a poison in the Standard for the Uniform Scheduling of Drugs and Poisons.

#### Additional national and/or international regulatory information

OSHA: Hazardous by definition of Hazard Communication Standard (40 CFR Part 370).

### Section 16 – Other Information

#### Key / legend to abbreviations and acronyms used in the MSDS

NOHSC	National Occupational Health and Safety Commission
SUSDP	Standard for the Uniform Scheduling of Drugs and Poisons
ES-TWA	Exposure Standard – Time weighted average
ES-STEL	Exposure Standard – Short term exposure level
ES-Peak	Exposure Standard – Peak level
FORS	Federal Office of Road and Safety
LC <sub>50</sub> :	Lethal concentration 50, median lethal concentration
LD <sub>50</sub>	Lethal dose 50. The single dose of a substance that causes the death of 50% of an animal population from exposure to the substance by any route other than inhalation
% (w/w)	Percent amount on a weight per weight basis
% (w/vol)	Percent amount on a weight per volume basis
PPM	Parts per million
Zone 1 Class 1	An area in which an explosive gas atmosphere can be expected to occur periodically or occasionally during normal operation. (More than 10 hours per year but less than 1000 hours per year)

#### Literature references

- Occupational Safety and Health Regulations 1996, State Law Publisher, Western Australia.
- National Code of Practice for the Preparation of Material Safety Data Sheets, [NOHSC:2011(2003)], Australian Government Publishing Service, Canberra, April 2003.
- Australian Code for the Transport of Dangerous Goods by Road and Rail, 7<sup>th</sup> Edition, Australian Government Publishing Service, Canberra, October 2007.
- Chemical Rubber Handbook, D.R. Lide, CRC Press, 65<sup>th</sup> Edition, Boca Ratón, 1987.
- Perry's Chemical Engineers' Handbook, R.H. Perry & D. Green, 6<sup>th</sup> Edition, McGraw-Hill, New York, 1984.
- International Critical Tables of Numerical Data, Physics, Chemistry and Technology, National Research Council, 1<sup>st</sup> Edition, McGraw-Hill, New York, 1928.
- Condensed Chemical Dictionary, G.G Hawley, 8<sup>th</sup> Edition, Van Nostrand Reinhold, New York, 1950.
- Dangerous Properties of Industrial Chemicals, N.I.Sax & R.J. Lewis (Sr), 7<sup>th</sup> Edition, Van Nostrand Reinhold, New York, 1984.
- Patty's Industrial Hygiene and Toxicology, F.A. Patty, 3<sup>rd</sup> Revised Edition, G.D. & F.E. Clayton (Editors), John Wiley & Sons, New York, 1981.
- Matheson Gas Data Book, W.Braker & A.L. Mossman, 6<sup>th</sup> Edition, Matheson Gas Products, Secaucus, 1980.
- Encyclopaedia of Occupational Health and Safety, International Labour Office, 4<sup>th</sup> Edition, J.M. Stellman (Editor), Geneva, 1998





## Ammonium Nitrate

ABN: 81 008 668 371

Kirk-Othmer Encyclopaedia of Chemical Technology, 4<sup>th</sup> Edition, Wiley InterScience, New York, 1997.

Ullmann's Encyclopaedia of Industrial Chemistry, F. Ullmann, 6<sup>th</sup> Edition, Wiley Interscience, New York, 2001.

Standard for the Uniform Scheduling of Drugs and Poisons, National Health and Medical Research Council, Australian Government Publishing Service, Canberra, 1992.

Poisons Act 1964, State Law Publisher, Western Australia, Reprinted 22 January 1999.

Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment, [NHSC:1003(1991)].

Hazardous Materials Handbook for Emergency Responders, Onguard Training for Life, J. Varela (Editor), Van Nostrand Reinhold, New York, 1996.

Chemwatch [www.chemwatch.net](http://www.chemwatch.net)

Guidance for the Compilation of Safety Data Sheets for Fertilizer Materials, European Fertilizer Manufacturers Association, online at [www.efma.org/Publications/Guidance/Index.asp](http://www.efma.org/Publications/Guidance/Index.asp)

### Sources for data

No data available.

### Important Notes

1. To the best of our knowledge this document complies with the National Code of Practice for the Preparation of Material Safety Data Sheets 2<sup>nd</sup> Edition [NOHSC:2011 (2003)].
2. This material safety data sheet summarises our best knowledge of the health and safety hazard information of the product and how to safely handle and use the product in the workplace. Each user should read this material safety data sheet and consider the information in the context of how the product will be handled and used in the workplace, including in conjunction with other products.
3. If clarification or further information is needed to ensure that an appropriate risk assessment can be made, the user should contact the Safety and Emergency Services Department, CSBP Limited on (08) 9411 8777 (Australia), +61 8 9411 8777 (Overseas).
4. Our responsibility for products sold, is subject to our terms and conditions, a copy of which is sent to our customers, and is also available on request.
5. CSBP reserves the right to make change to material safety data sheets without notice.