

Safety Data Sheet



1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name: **AMMONIUM NITRATE**

Other name(s): Nitropril, Anopril, Marbyl, Ammonium nitrate prills, LDAN, Low density ammonium nitrate, PPAN, Porous prilled ammonium nitrate

Recommended Use of the Chemical and Restrictions on Use Explosives manufacture.
This material is classified as a Security Sensitive Ammonium Nitrate (SSAN). Various government controls may apply to this material.

Supplier: Orica Australia Pty Ltd
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Melbourne 3000
Australia

Telephone Number: +61 3 9665 7111
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Emergency Telephone: **AUSTRALIA: 1 800 033 111 (ALL HOURS)**
INTERNATIONAL AUSTRALIA: +61 3 9663 2130 (ALL HOURS)

Please ensure you refer to the limitations of this Safety Data Sheet as set out in the "Other Information" section at the end of this Data Sheet.

2. HAZARDS IDENTIFICATION

Classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for Transport by Road and Rail; DANGEROUS GOODS.

This material is hazardous according to Safe Work Australia; HAZARDOUS CHEMICAL.

Classification of the chemical:

Oxidising solids - Category 3
Eye Irritation - Category 2A

SIGNAL WORD: WARNING



Hazard Statement(s):

H272 May intensify fire; oxidizer.
H319 Causes serious eye irritation.
AUH031 Contact with acids liberates toxic gas.
AUH044 Risk of explosion if heated under confinement.

Precautionary Statement(s):

Prevention:

P210 Keep away from heat.
P220 Store away from clothing, incompatible materials and combustible materials.
P221 Take any precaution to avoid mixing with combustibles and incompatible materials.
P264 Wash thoroughly after handling.
P280 Wear eye protection.

Product Name: AMMONIUM NITRATE
Substance No: 000022017701

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**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.

P337+P313 If eye irritation persists: Get medical attention.

P370+P378 In case of fire: Use flooding quantities of water for extinction.

Storage:

No storage statements.

Disposal:

P501 Dispose of contents and container in accordance with local regulations.

Poisons Schedule (SUSMP): None allocated.

3. COMPOSITION AND INFORMATION ON INGREDIENTS

| Components | CAS Number | Proportion | Hazard Codes |
|-------------------------|------------|------------|--------------|
| Ammonium nitrate | 6484-52-2 | >98% w/w | H272 H319 |
| Other minor ingredients | - | <2% w/w | - |

4. FIRST AID MEASURES

For advice, contact a Poisons Information Centre (e.g. phone Australia 131 126; New Zealand 0800 764 766) or a doctor.

Inhalation:

Remove victim from area of exposure - avoid becoming a casualty. Remove contaminated clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm. Keep at rest until fully recovered. If patient finds breathing difficult and develops a bluish discolouration of the skin (which suggests a lack of oxygen in the blood - cyanosis), ensure airways are clear of any obstruction and have a qualified person give oxygen through a face mask. Apply artificial respiration if patient is not breathing. Seek immediate medical advice.

Skin Contact:

If skin contact occurs, remove contaminated clothing and wash skin with running water. If irritation occurs seek medical advice. Nitrates can be absorbed through cut, burnt or broken skin. Launder contaminated clothing before reuse.

Eye Contact:

If in eyes, hold eyelids apart and flush the eye continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre or a doctor, or for at least 15 minutes. Seek medical attention.

Ingestion:

Rinse mouth with water. If swallowed, do NOT induce vomiting. Give a glass of water. Seek medical advice.

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Indication of immediate medical attention and special treatment needed:

Treat symptomatically. Treat as for exposure to nitrates. May cause methemoglobinemia. Clinical findings: The smooth muscle relaxant effect of nitrate salts may lead to headache, dizziness and marked hypotension.

Cyanosis is clinically detectable when approximately 15% of the haemoglobin has been converted to methaemoglobin (ie. ferric iron).

Symptoms such as headache, dizziness, weakness and dyspnoea occur when methaemoglobin concentrations are 30% to 40%; at levels of about 60%, stupor, convulsions, coma and respiratory paralysis occur and the blood is a chocolate brown colour. At higher levels death may result. Spectrophotometric analysis can determine the presence and concentration of methaemoglobin in blood.

Treatment:

1. Give 100% oxygen.
2. In cases of (a) ingestion: use gastric lavage, (b) contamination of skin (unburnt or burnt): continue washing to remove salts.
3. Observe blood pressure and treat hypotension if necessary.
4. When methaemoglobin concentrations exceed 40% or when symptoms are present, give methylene blue 1 to 2 mg/kg body weight in a 1% solution by slow intravenous injection. If cyanosis has not resolved within one hour a second dose of 2 mg/kg body weight may be given. The total dose should not exceed 7 mg/kg body weight as unwanted effects such as dyspnoea, chest pain, vomiting, diarrhoea, mental confusion and cyanosis may occur. Without treatment methaemoglobin levels of 20-30% revert to normal within 3 days.
5. Bed rest is required for methaemoglobin levels in excess of 40%.
6. Continue to monitor and give oxygen for at least two hours after treatment with methylene blue.
7. Consider transfer to centre where haemoperfusion can be performed to remove the nitrates from the blood if the condition of the patient is unstable.

Effects from exposure to decomposition products including nitrogen dioxide (possible decomposition component of blasting fumes) can include chest discomfort, shortness of breath and possible pulmonary oedema, the onset of which may be delayed. The exposed person should be kept under medical surveillance for 24 hours for delayed onset of pulmonary oedema.

Further observation for 2-3 weeks may be required to detect the onset of the inflammatory changes of bronchiolitis fibrosa obliterans.

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media:

Coarse water spray. Water spray (large quantities).

Unsuitable Extinguishing Media:

Extinguishing methods based on smothering are ineffective in the case of oxidizing agents. DO NOT USE the following as extinguishing media: Carbon dioxide, dry chemical powder.

Hazchem or Emergency Action Code: 1Y

Specific hazards arising from the chemical:

WARNING:

Explosion risk in case of fire, especially if contaminated or confined. Molten product may explode from friction, shock or containment. In the case of an intense fire evacuate all personnel to at least 1000 m.

Oxidizing substance. Increases intensity of a fire, even in the absence of oxygen. Ammonium nitrate on its own is not combustible, however it supports the combustion of other materials. Contact with combustible material may cause fire. Decomposes on heating emitting irritating white fumes and/or brown fumes. Brown fumes indicate the presence of toxic oxides of nitrogen.

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Special protective equipment and precautions for fire-fighters:

WARNING:

A major fire may involve a risk of explosion. Evacuate area immediately. Allow fire to burn out. An adjacent detonation may also involve the risk of explosion. Heating can cause decomposition of the material, which can lead to the containers exploding. Confinement of material may result in detonation.

In the case of an intense fire evacuate all personnel to a least 1000 metres. Police and emergency personnel should be notified immediately. If possible remove vehicles and further heat and ignition sources from area. Do not return to areas until the site has completely cooled down.

Decomposes on heating emitting irritating white fumes and/or brown fumes. Brown fumes indicate the presence of toxic oxides of nitrogen. On detection of fire the compartment(s) should be opened up to provide maximum ventilation. Fire-fighters to wear self-contained breathing apparatus and suitable protective clothing if there is a risk of exposure to products of combustion/decomposition. If safe to do so, remove containers from path of fire. If safe to do so, prevent molten material from being confined in drains, pipes etc.

6. ACCIDENTAL RELEASE MEASURES

Emergency procedures/Environmental precautions:

Shut off all possible sources of ignition. Clear area of all unprotected personnel. Do not allow the product to mix with combustible/organic materials.

Do not allow container or product to get into drains, sewers, streams or ponds. If contamination of sewers or waterways has occurred advise local emergency services.

Personal precautions/Protective equipment/Methods and materials for containment and cleaning up:

Clean up spillages immediately. Contain - prevent run off into drains and waterways. Wear protective equipment to prevent skin and eye contact and breathing in dust. Sweep or vacuum up, but avoid generating dust. Collect and seal in properly labelled containers or drums for disposal. (Loose fitting lids). Do not return spilled material to original container. Ensure that contaminated material (clothing, pallets) is thoroughly washed.

This material is classified as a Security Sensitive Ammonium Nitrate (SSAN). Spillage recovery needs to be appropriately documented and material accurately accounted for.

In the case of a transport accident notify the Police, Regulatory Authorities and Orica Australia Pty Ltd (Telephone: 1800 033 111 -- 24 hour service) and/or Orica New Zealand Limited (Telephone: 0800 734 607 -- 24 hour service) or Orica International Australia: (Telephone: +61 3 9663 2130 -- 24 hour service).

7. HANDLING AND STORAGE

Precautions for safe handling:

Avoid skin and eye contact and breathing in dust. Avoid handling which leads to dust formation. Handle with care. Keep out of reach of children.

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Conditions for safe storage, including any incompatibilities:

Store in a cool, dry, well ventilated place and out of direct sunlight. Store away from sources of heat or ignition. Store away from combustible materials including organic materials, reducing agents, metal powders, strong acids, nitrites, chlorates, chlorides and permanganates. Store away from incompatible materials described in Section 10. Keep containers closed when not in use - check regularly for spills.

Concrete floors are recommended for storage. If ammonium nitrate is to be stored in bulk, the surface must be treated so that it is resistant to attack. Bulk ammonium nitrate should not be stored on a bituminous floor. Floors drains, recesses or other areas of possible confinement should be eliminated to prevent entrapment/confinement of molten (flowing) ammonium nitrate during a fire.

This product when stored in a confined, unventilated space/hold can give off ammonia or other odour and lead to the depletion of oxygen within this space and other confined spaces. It is therefore essential that ventilation is carried out prior to entry.

Ensure ammonium nitrate is stored securely and in accordance with regulations/controls issued by relevant authority. The secure storage of ammonium nitrate within Australia includes but is not limited to the use of site security plans, locking the facility/container with physical restraining items, validation and record keeping of all stock, and where deemed necessary through a risk management approach constant surveillance.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters: No value assigned for this specific material by Safe Work Australia. However, Workplace Exposure Standard(s) for decomposition product(s):

Nitrogen dioxide: 8hr TWA = 5.6 mg/m³ (3 ppm), 15 min STEL = 9.4 mg/m³ (5 ppm)

As published by Safe Work Australia Workplace Exposure Standards for Airborne Contaminants.

TWA - The time-weighted average airborne concentration of a particular substance when calculated over an eight-hour working day, for a five-day working week.

STEL (Short Term Exposure Limit) - the airborne concentration of a particular substance calculated as a time-weighted average over 15 minutes, which should not be exceeded at any time during a normal eight hour work day. According to current knowledge this concentration should neither impair the health of, nor cause undue discomfort to, nearly all workers.

These Workplace Exposure Standards are guides to be used in the control of occupational health hazards. All atmospheric contamination should be kept to as low a level as is workable. These workplace exposure standards should not be used as fine dividing lines between safe and dangerous concentrations of chemicals. They are not a measure of relative toxicity.

Appropriate engineering controls:

Use in well ventilated areas. Avoid generating and breathing in dusts. Keep containers closed when not in use.

If in the handling and application of this material, safe exposure levels could be exceeded, the use of engineering controls such as local exhaust ventilation must be considered and the results documented. If achieving safe exposure levels does not require engineering controls, then a detailed and documented risk assessment using the relevant Personal Protective Equipment (PPE) (refer to PPE section below) as a basis must be carried out to determine the minimum PPE requirements.

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Individual protection measures, such as Personal Protective Equipment (PPE):

The selection of PPE is dependent on a detailed risk assessment. The risk assessment should consider the work situation, the physical form of the chemical, the handling methods, and environmental factors.

OVERALLS, SAFETY SHOES, CHEMICAL GOGGLES, GLOVES, DUST MASK.



Wear overalls, chemical goggles and impervious gloves. Avoid generating and inhaling dusts. If determined by a risk assessment an inhalation risk exists, wear a dust mask/respirator meeting the requirements of AS/NZS 1715 and AS/NZS 1716. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storage or re-use.

9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|--|
| Physical state: | Granular Solid / Prills |
| Colour: | White to Off-white |
| Odour: | Negligible |
| Solubility: | Soluble in water. |
| Specific Gravity: | 0.72 - 0.78 g/cm ³ (bulk density) |
| Relative Vapour Density (air=1): | Not available |
| Vapour Pressure (20 °C): | Negligible |
| Flash Point (°C): | Not applicable |
| Flammability Limits (%): | Not applicable |
| Autoignition Temperature (°C): | Not available |
| Solubility in water (g/L): | 190g/100g at 20°C |
| Melting Point/Range (°C): | 160 - 169 |
| Boiling Point/Range (°C): | Decomposes (approx 210 °C) |
| Decomposition Point (°C): | 210°C (approx) |
| pH: | 4.5 - 5.2 (10% solution @ 20°C) |
| Viscosity: | Not available |
| Evaporation Rate: | Not available |

10. STABILITY AND REACTIVITY

| | |
|----------------------------|---|
| Reactivity: | Powerful oxidizing agent. Oxidizing agents may cause vigorous reactions. |
| Chemical stability: | Stable under normal ambient and anticipated storage and handling conditions when free of contaminants including inorganic and organic materials. Hygroscopic: absorbs moisture or water from surrounding air. May explode under confinement and high temperature, but not readily detonated. May explode due to nearby detonations. |

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Possibility of hazardous reactions:

Oxidizing agent. Supports combustion of other materials and increases intensity of a fire. Will react with organic materials, and reducing agents. Reacts with nitrites, chlorides, chlorates, permanganates and metal powders. When mixed with strong acids, and occasionally during blasting, it produces an irritating toxic brown gas, mostly of nitrogen dioxide. When molten (such as in a fire situation) may decompose violently due to shock or pressure.

Contamination with chlorine bleaches, pool chlorine and hypochlorites may result in the formation of explosive nitrogen trichloride. Heating can cause expansion or decomposition of the material, which can lead to the containers exploding.

Conditions to avoid:

Avoid exposure to heat, sources of ignition, and open flame. Will react with organic materials and reducing agents. Avoid contact with combustible chemicals. Avoid contact with other chemicals. Avoid dust generation. Avoid exposure to moisture.

Incompatible materials:

Ammonium nitrate is a powerful oxidizing agent; it is incompatible with tetranitromethane, dichloroisocyanuric acid, trichloroisocyanuric acid, bromates, chlorates, chlorites, hypochlorites, perchlorates, permanganates, chloroisocyanurate, nitrites, powdered metals. Incompatible with combustible materials. Incompatible with reducing agents. Incompatible with copper, zinc, brass and bronze.

Hazardous decomposition products:

Oxides of nitrogen. Nitrous oxide. Ammonium nitrate fumes. Ammonia. Nitric acid.

11. TOXICOLOGICAL INFORMATION

No adverse health effects expected if the product is handled in accordance with this Safety Data Sheet and the product label. Symptoms or effects that may arise if the product is mishandled and overexposure occurs are:

Ingestion:

Swallowing can result in nausea, vomiting, diarrhoea, and abdominal pain. Swallowing large amounts may result in headaches, dizziness and a reduction in blood pressure (hypotension).

Eye contact:

An eye irritant. Exposure to the dust may cause discomfort due to particulate nature. May cause physical irritation to the eyes.

Skin contact:

Repeated or prolonged skin contact may lead to irritation. Can be absorbed through cut, broken, or burnt skin with resultant adverse effects. See effects as noted under 'Inhalation'.

Inhalation:

Breathing in dust may result in respiratory irritation. Blasting may produce a toxic brown gas of nitrogen dioxide. Inhalation of the gas may result in chest discomfort, shortness of breath and possible pulmonary oedema, the onset of which may be delayed.

Absorption of ammonium nitrate by inhalation, ingestion or through burnt or broken skin may cause dilation of blood vessels by direct smooth muscle relaxation and may also cause methaemoglobinaemia. May cause dizziness, drowsiness, nausea and headache due to central nervous system effects.

Acute toxicity:

Oral LD50 (rat): 2217 mg/kg for ammonium nitrate

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Serious eye damage/irritation: Causes serious eye irritation.

Respiratory or skin sensitisation: Not known or reported to be a skin or respiratory sensitiser.

Chronic effects: No information available for the product.

Aspiration hazard: Not classified.

In humans and animals methaemoglobinaemia has occurred under untreated circumstances following overexposure to nitrates. Absorption of nitrates by any route may cause dilation of blood vessels by direct smooth muscle relaxation.

12. ECOLOGICAL INFORMATION

Ecotoxicity Avoid contaminating waterways. Ammonium nitrate is a plant nutrient. Large scale contamination may kill vegetation and cause poisoning in livestock and poultry.

Low toxicity to aquatic life. TLm 96: 10-100 ppm

Ammonia: 48hr LC50 (Cyprinus carpio): 1.15-1.72mg un-ionised NH₃/L; 95-102 mg total NH₃/L

Nitrates: 96hr LC50 (Chinook salmon, rainbow trout, bluegill): 420-1360 mg NO₃-/L

Persistence/degradability: The material is biodegradable. Not expected to bioconcentrate or accumulate.

Mobility in soil: The material is water soluble and may disperse in soil.

Aquatic toxicity: Ammonium nitrate was evaluated at 5, 10, 25 and 50 mg (NH₄⁺)/L. The fertility of *Daphnia magna* was decreased at 50 mg/L. Post embryonic growth of crustacea was impaired at 10, 25 and 50 mg/L.

Can stimulate weed and algal growth in static surface waters.

13. DISPOSAL CONSIDERATIONS

Disposal methods:

Refer to Waste Management Authority. Dispose of contents and container in accordance with local regulations. Empty containers must be either rendered totally unusable, or if to be recycled for use, decontaminated by rinsing thoroughly with water. Rinsing water needs to be disposed of carefully.

Waste ammonium nitrate may be disposed of as a fertiliser, but this method of disposal must be agreed with the authorities.

As this material is classified as a Security Sensitive Ammonium Nitrate (SSAN) disposal of material needs to be appropriately documented and material accurately accounted for.

14. TRANSPORT INFORMATION

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Road and Rail Transport

Classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for Transport by Road and Rail; DANGEROUS GOODS.



UN No: 1942
Transport Hazard Class: 5.1 Oxidizing Agent
Packing Group: III
Proper Shipping Name or Technical Name: AMMONIUM NITRATE
Hazchem or Emergency Action Code: 1Y

Marine Transport

Classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea; DANGEROUS GOODS.

UN No: 1942
Transport Hazard Class: 5.1 Oxidizing Agent
Packing Group: III
Proper Shipping Name or Technical Name: AMMONIUM NITRATE

IMDG EMS Fire: F-H
IMDG EMS Spill: S-Q

Air Transport

Classified as Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air; DANGEROUS GOODS.

UN No: 1942
Transport Hazard Class: 5.1 Oxidizing Agent
Packing Group: III
Proper Shipping Name or Technical Name: AMMONIUM NITRATE

15. REGULATORY INFORMATION

Classification:

This material is hazardous according to Safe Work Australia; HAZARDOUS CHEMICAL.

Classification of the chemical:

Oxidising solids - Category 3
Eye Irritation - Category 2A

Hazard Statement(s):

H272 May intensify fire; oxidizer.
H319 Causes serious eye irritation.
AUH031 Contact with acids liberates toxic gas.
AUH044 Risk of explosion if heated under confinement.

Poisons Schedule (SUSMP): None allocated.

Product Name: AMMONIUM NITRATE
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All the constituents of this material are listed on the Australian Inventory of Chemical Substances (AICS).

Various regulations/controls/authorisations/licences may apply governing the manufacture, importation, exportation, use, handling, storage, sale/supply, transport and disposal of ammonium nitrate. Ammonium nitrate in Australia is considered a security sensitive material and loss, theft, attempted theft and unexplained discrepancies shall be reported to authorities. Record keeping and licensing of individuals shall be required and maintained.

16. OTHER INFORMATION

'Registry of Toxic Effects of Chemical Substances'. Ed. D. Sweet, US Dept. of Health & Human Services: Cincinnati, 2016.

In: 'The Dictionary of Substances and their Effects'. Ed. Gangolli S. Royal Society of Chemistry, 1999.

PACIA Code of Practice for Secure Distribution of High Analysis Ammonium Nitrate. 03/ 2004.

'Principles for the Regulation of Ammonium Nitrate COAG (Council of Australian Government)'.

This safety data sheet has been prepared by Ixom Operations Pty Ltd Toxicology & SDS Services.

Reason(s) for Issue:

Revised Primary SDS

Alignment to Safe Work Australia requirements

Alignment to NOHSC requirements

Alignment to GHS requirements

Minor Text Changes

This SDS summarises to our best knowledge at the date of issue, the chemical health and safety hazards of the material and general guidance on how to safely handle the material in the workplace. Since Orica Limited cannot anticipate or control the conditions under which the product may be used, each user must, prior to usage, assess and control the risks arising from its use of the material.

If clarification or further information is needed, the user should contact their Orica representative or Orica Limited at the contact details on page 1.

Orica Limited's responsibility for the material as shipped is subject to the terms and conditions of sale, a copy of which is available upon request.