MATERIAL SAFETY DATA SHEET

Ammonium Nitrate

Section 1 – Identification of the Material and Supplier

Product Name
Ammonium nitrate

Other names
Detapril, Nitropril, porous prill. Company product code 1720.

Recommended use
Production of explosives and fertiliser manufacture.

Company name
CSBP Limited

Address
Kwinana Beach Road, KWINANA

State
Western Australia

Postcode
6167

Telephone number
(08) 9411 8777 (Australia), +61 8 9411 8777 (Overseas)

Emergency telephone number
1800 093 333 (Australia), +61 8 9411 8444

Section 2 – Hazard Identification

Hazard Classification, including a statement of overall hazardous nature
HAZARDOUS SUBSTANCE.
Ammonium nitrate is not classified as hazardous and is not specified in the NOHSC List of Designated Hazardous Substances [NOHSC:10005(1999)].

DANGEROUS GOODS.

Risk Phrases
Ammonium nitrate is classified as an oxidizing agent.
R22 Harmful if swallowed
R31 Contact with acid liberates toxic gas
R36 Irritating to eyes

Safety Phrases
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 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

Poison Schedule
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

<table>
<thead>
<tr>
<th>Chemical identity of ingredients</th>
<th>Proportion of ingredients</th>
<th>CAS Number for ingredients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium nitrate</td>
<td>99% (wt/wt)</td>
<td>6484 -52-2</td>
</tr>
<tr>
<td>Moisture and additives</td>
<td>Remainder</td>
<td></td>
</tr>
</tbody>
</table>
MATERIAL SAFETY DATA SHEET
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 (methaemoglobinemia) 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)
### 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**
1Y

### 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.
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

<table>
<thead>
<tr>
<th>ES-TWA</th>
<th>ES-STEL</th>
<th>ES-Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>No data available</td>
<td>10 mg/m³</td>
<td>No data available</td>
</tr>
</tbody>
</table>

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.
## Section 9 – Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance (colour, physical form, shape)</td>
<td>White odourless prills, with strong disagreeable acrid taste.</td>
</tr>
<tr>
<td>Odour</td>
<td>Odourless</td>
</tr>
<tr>
<td>pH</td>
<td>pH of 10% solution: &gt; 4.6</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>Ammonium nitrate does not exert significant vapour pressure.</td>
</tr>
<tr>
<td>Vapour density</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Boiling point/Freezing/melting point</td>
<td>Decomposes from 170 °C before boiling. Freezing/melting point: 170 °C.</td>
</tr>
<tr>
<td>Solubility</td>
<td>Solubility in water: 118.3 g/100g of water at 0 °C; slightly soluble in alcohol; not soluble in acetone.</td>
</tr>
<tr>
<td>Specific gravity or density</td>
<td>Bulk density: 755 ± 25 kg/m³.</td>
</tr>
<tr>
<td>Flash point and method of detecting flash point</td>
<td>Ammonium nitrate does not give off flammable vapours.</td>
</tr>
<tr>
<td>Upper and lower flammable (explosive) limits in air</td>
<td>Ammonium nitrate is not flammable.</td>
</tr>
<tr>
<td>Ignition temperature</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not applicable.</td>
</tr>
</tbody>
</table>

## Section 10 – Stability and Reactivity

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical stability</td>
<td>When stored and handled in accordance with Australian Standard AS 4326 <em>The storage and handling of oxidizing agents</em>, ammonium nitrate remains stable.</td>
</tr>
<tr>
<td>Conditions to avoid</td>
<td>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.</td>
</tr>
<tr>
<td>Incompatible materials</td>
<td>Ammonium nitrate is incompatible with copper, zinc, or their alloys (i.e., bronze, brass, galvanised metals, etc.), aluminium powder and mild steel.</td>
</tr>
</tbody>
</table>
### 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 nitrates, 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 methaemoglobinemia (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. LD₅₀ (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, NH₄⁺, is adsorbed by the soil. When released into water, ammonium nitrate is expected to readily biodegrade; the nitrate ion, NO₃⁻, 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 NO₃⁻ ion is mobile. The NH₄⁺ ion is adsorbed by the soil.
Material Safety Data Sheet

Ammonium Nitrate

Environmental Fate (exposure)
Low toxicity to aquatic life. TLm 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 NO₃⁻/L.

Acute Toxicity to Fish
48 hr LC₅₀ (Cyprinus carpio): 1·15 - 1·72 mg un-ionised NH₃/L; 95 – 102 mg total NH₃/L;
96 hr LC₅₀ (Chinook Salmon, rainbow trout, bluegill): 420 -1,360 mg NO₃⁻/L;
TLm (Tadpoles): 910 mg NH₃/L.

Chronic Toxicity to Fish
7 day LC₅₀ (Fingerling rainbow trout): 1,065 mg/L.

Acute Toxicity to Aquatic Invertebrates
EC₅₀ (Daphnia magna): 555 mg/L; 124·9 mg total NH₃/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
1Y
MATERIAL SAFETY DATA SHEET

Ammonium Nitrate

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

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
LC50: Lethal concentration 50, median lethal concentration
LD50 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
%(wt/wt) Percent amount on a weight per weight basis
%(wt/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
MATERIAL SAFETY DATA SHEET

Ammonium Nitrate

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

Chemwatch 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

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 2nd 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.