



Material Safety Data Sheet

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name: BULK FORTAN PRODUCTS

Other name(s): Fortan Advantage System, Fortan Coal System, Fortan Eclipse System, Fortan Extra System, Fortan Xtreme

Recommended Use: Mining, quarrying and general blasting work, usually in bulk applications. Normally delivered down a borehole as a bulk explosive.

Supplier: Orica Australia Pty Ltd
ABN: 004 117 828
Street Address: 1 Nicholson Street
Melbourne 3000
Australia

Telephone Number: +61 3 9665 7111
Facsimile: +61 3 9665 7937

Emergency Telephone: 1 800 033 111 (ALL HOURS)

2. HAZARDS IDENTIFICATION

This material is hazardous according to criteria of ASCC; HAZARDOUS SUBSTANCE.

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

Risk Phrases: Risk of explosion by shock, friction, fire or other sources of ignition. Limited evidence of a carcinogenic effect.

Safety Phrases: Keep away from sources of ignition - No Smoking. Avoid contact with skin. Wear suitable protective clothing and gloves.

Poisons Schedule: None allocated.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components / CAS Number	Proportion	Risk Phrases
Ammonium nitrate 6484-52-2	>60%	-
Fuels, diesel 68334-30-5	<10%	R40 Carc. Cat. 3, R65, R66, R51/53
Non hazardous component(s)	to 100%	-

Product Name: BULK FORTAN PRODUCTS
Substance No: 00000009245

Issued: 26/09/2007 **Version:** 2

Material Safety Data Sheet



4. FIRST AID MEASURES

For advice, contact a Poisons Information Centre (Phone eg. Australia 131 126; New Zealand 0 800 764766) 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 discoloration 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 clothing before reuse.

Eye Contact: If in eyes, wash out immediately with water. In all cases of eye contamination it is a sensible precaution to seek medical advice.

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

Medical attention and special treatment: Treat symptomatically. Explosive material. May cause methemoglobinemia. Treat as for exposure to nitrates. For ammonium nitrate: 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.
8. Following inhalation of oxides of nitrogen the patient should be observed in hospital for 24 hours for delayed onset of pulmonary oedema.

Product Name: BULK FORTAN PRODUCTS
Substance No: 00000009245

Issued: 26/09/2007 **Version:** 2

Material Safety Data Sheet



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

Hazards from combustion products: On burning under confined or semi-confined conditions, some oxides of nitrogen and/or carbon will be present. Brown fumes indicate the presence of toxic oxides of nitrogen.

Precautions for fire fighters and special protective equipment: Explosive material. In case of small fire where the actual explosive is not involved, carefully remove explosive to a safe distance, otherwise evacuate area immediately and allow to burn. Do NOT fight fire. A major fire may involve a risk of explosion. An adjacent detonation may also involve the risk of explosion.

Hazchem Code: E

6. ACCIDENTAL RELEASE MEASURES

Emergency procedures: Clear area of all unprotected personnel. Shut off all possible sources of ignition. Avoid friction and impact. Wear protective equipment to prevent skin and eye contact. In the case of a transport accident notify the Police, Explosives Inspector and Orica Australia Pty Ltd (Telephone: 1800 033 111 -- 24 hour service) and/or Orica New Zealand Pty Ltd (Telephone: 0800 734 607 -- 24 hour service). If contamination of sewers or waterways has occurred advise local emergency services.

Methods and materials for containment and clean up: Handle with care. Contain - prevent run off into drains and waterways. Collect with non-metallic implements. Use a spark-free shovel. Collect in properly labelled containers, with loose fitting lids, for disposal.

7. HANDLING AND STORAGE

Conditions for safe storage: Store material in a well ventilated magazine suitably licensed for Class 1.1D Explosives. Store away from incompatible materials described in Section 10. Store in a cool, dry, well ventilated place and out of direct sunlight. Store away from sources of heat or ignition. Store away from strong acids, strong alkalis, nitrites, chlorates, chlorides and permanganates. Ammonium Nitrate is incompatible with, and must be stored away from, tetranitromethane, dichloroisocyanuric acid, trichloroisocyanuric acid, any bromate, chlorate, chlorite, hypochlorite or chloroisocyanurate or any inorganic nitrite. Keep containers closed when not in use - check regularly for spills.

Precautions for safe handling: Handle with care. Avoid skin and eye contact and breathing in vapour/dust. Avoid all contact with other chemicals. Keep out of reach of children. Do NOT subject the material to impact, friction between hard surfaces nor to any form of heating.

Product Name: BULK FORTAN PRODUCTS
Substance No: 00000009245

Issued: 26/09/2007 **Version:** 2

Material Safety Data Sheet



8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits:

No value assigned for this specific material by the National Occupational Health and Safety Commission. However, Exposure Standard(s) for constituent(s):

Oil mist, refined mineral: 8hr TWA = 5 mg/m³

As published by the National Occupational Health and Safety Commission.

These 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 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.

TWA - The time-weighted average airborne concentration over an eight-hour working day, for a five-day working week over an entire working life.

Supplier recommended Exposure Standard: Diesel Oil: 500 mg/m³ total vapour (approx 100 ppm) or 5 mg/m³ stable aerosols for 8 hour time-weighted average (TWA). (1)

Engineering controls:

Ensure ventilation is adequate and that air concentrations of components are controlled below quoted Exposure Standards.

Personal Protective Equipment:

The selection of PPE is dependant 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.

Orica Personal Protection Guide No. 1, 1998: B - OVERALLS, SAFETY SHOES, SAFETY GLASSES, GLOVES.

Wear overalls, safety glasses and impervious gloves. Always wash hands before smoking, eating, drinking or using the toilet.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Gel / Solid . Freshly prepared bulk explosive is hot (60-70°C).
Colour:	Cream or Gold
Odour:	Negligible
Solubility:	Insoluble in water.
Flash Point (°C):	Not applicable.

10. STABILITY AND REACTIVITY

Chemical stability: Explosive material. Avoid ignition sources, static electricity discharge and friction. Detonation may occur from heavy impact or excessive heating, particularly under confinement.

Conditions to avoid: Avoid exposure to heat, sources of ignition, and open flame. Avoid contact with other chemicals. Avoid build up of static electricity.

Product Name: BULK FORTAN PRODUCTS
Substance No: 00000009245

Issued: 26/09/2007 **Version:** 2



Material Safety Data Sheet

- Incompatible materials:** Incompatible with strong alkalis. Incompatible with strong acids. Incompatible with combustible materials. Incompatible with permanganates, strong oxidising agents, acids and alkalis. Ammonium nitrate is a powerful oxidising agent. It is incompatible with tetranitromethane, dichloroisocyanuric acid, trichloroisocyanuric acid, any bromate, chlorate, chlorite, hypochlorite or chloroisocyanurate, any inorganic nitrite and metal powders.
- Hazardous decomposition products:** Oxides of carbon. Oxides of nitrogen. When heated to decomposition (unconfined) ammonium nitrate produces nitrous oxide, white ammonium nitrate fumes and water. When mixed with strong acids, and occasionally during blasting, it produces an irritating toxic brown gas, mostly of nitrogen dioxide. When molten may decompose violently due to shock or pressure.
- Hazardous reactions:** Explosive material. Detonation may occur from heavy impact or excessive heating, particularly under confinement. Hazardous polymerisation will not occur.

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:** May be an eye irritant.
- Skin contact:** Contact with skin may result in irritation. Repeated or prolonged skin contact may lead to irritant contact dermatitis. Can be absorbed through the skin with resultant adverse effects. See effects as noted under 'Inhalation'.
- Inhalation:** Material may be irritant to the mucous membranes of the respiratory tract (airways). 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.

Long Term Effects:

No information available for the product. Available evidence from animal studies indicate that repeated or prolonged exposure to a component of this material could result in effects on the skin. This material contains within the diesel oil component of this formulation polycyclic aromatic hydrocarbons (PAHs). Some PAHs have been implicated as potential skin carcinogens in humans under conditions of poor personal hygiene, prolonged or repeated skin contact and exposure to sunlight. Toxic effects are unlikely to occur if good personal hygiene is practised. (1)

Toxicological Data:

No LD50 data available for the product. For the constituent AMMONIUM NITRATE:

Product Name: BULK FORTAN PRODUCTS
Substance No: 00000009245

Issued: 26/09/2007 **Version:** 2



Material Safety Data Sheet

Oral LD50 (rat): 2217 mg/kg. (2)

In humans and animals methaemoglobinaemia has occurred under untreated circumstances following the ingestion of nitrates. (2)

12. ECOLOGICAL INFORMATION

Ecotoxicity Avoid contaminating waterways.

Aquatic toxicity:

Toxic to aquatic organisms. 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. (2)

13. DISPOSAL CONSIDERATIONS

Disposal methods: Refer to Waste Management Authority. Dispose of material through a licensed waste contractor. Small quantities of damaged or deteriorated explosives may be destroyed by inclusion in a blast hole containing good explosive(s). For large quantities of damaged or deteriorated explosives notify Orica Australia Pty Ltd and/or Orica New Zealand Pty Ltd.

14. TRANSPORT INFORMATION

Road and Rail Transport

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

UN No: 0241
Class-primary 1.1 D Explosive
Proper Shipping Name: EXPLOSIVE, BLASTING, TYPE E

Hazchem Code: E

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: 0241
Class-primary: 1.1 D Explosive
Proper Shipping Name: EXPLOSIVE, BLASTING, TYPE E

Air Transport

TRANSPORT PROHIBITED under the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air in passenger aircraft and cargo aircraft.

Product Name: BULK FORTAN PRODUCTS
Substance No: 00000009245

Issued: 26/09/2007

Version: 2



Material Safety Data Sheet

15. REGULATORY INFORMATION

- Classification:** This material is hazardous according to criteria of ASCC; HAZARDOUS SUBSTANCE.
- Hazard Category:** Xn: Harmful
- Risk Phrase(s):** R2: Risk of explosion by shock, friction, fire or other sources of ignition.
R40: Limited evidence of a carcinogenic effect.
- Safety Phrase(s):** S16: Keep away from sources of ignition - No smoking.
S24: Avoid contact with skin.
S36/37: Wear suitable protective clothing and gloves.
- Poisons Schedule:** None allocated.

All the constituents of this material are listed on the Australian Inventory of Chemical Substances (AICS).

16. OTHER INFORMATION

- (1) Supplier Material Safety Data Sheet; 12/2002
(2) Material Safety Data Sheet - Orica Australia Pty Ltd; 09/ 2006.

This material safety data sheet has been prepared by SH&E Shared Services, Orica.

Reason(s) for Issue:
Product name change

This MSDS 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 sold is subject to the terms and conditions of sale, a copy of which is available upon request.

Product Name: BULK FORTAN PRODUCTS
Substance No: 00000009245

Issued: 26/09/2007 **Version:** 2