

SAFETY DATA SHEET

PRIME
explosives
DRILL & BLAST SERVICES



PRIMEX ANFO

Issued: 20/08/2018

Version: 02

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name: PRIMEX ANFO

Other name(s): AMMONIUM NITRATE/FUEL OIL, ANFO 94/6

Recommended Use of the Chemical and Restrictions on Use: Blasting explosive

Supplier: Prime Blasting Services Ltd
Street Address: 24 Tenth Avenue
Tauranga 3110
New Zealand

Telephone Number: +64 7 577 1275
Emergency Telephone: 0800 111 077 (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 a Dangerous Good according to NZS 5433:2012 Transport of Dangerous Goods on Land.
Classified as hazardous according to criteria in the HS (Minimum Degrees of Hazard) Regulations 2001.

SIGNAL WORD: DANGER

Subclasses:

Subclass 1.1 Category D

Subclass 6.1 Category D - Substances which are acutely toxic.

Subclass 6.3 Category A - Substances that are irritating to the skin.

Subclass 6.4 Category A - Substances that are irritating to the eye.

Subclass 6.9 Category B - Substances that are harmful to human target organs or systems.

Subclass 9.1 Category D - Substances that are slightly harmful to the aquatic environment or are otherwise designed for biocidal action.

The 'Hazardous Substances (Tracking) Regulations 2001' are applicable to this material.



Hazard Statement(s):

H201 Explosive; mass explosion hazard.

H302 Harmful if swallowed.

H315 Causes skin irritation.

H319 Causes serious eye irritation.

H373 May cause damage to organs through prolonged or repeated exposure.

H413 May cause long lasting harmful effects to aquatic life.

Precautionary Statement(s):

Prevention:

P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.

P250 Do not subject to grinding/shock/friction/fire or other sources of ignition.

P260 Do not breathe dust/vapours.

P264 Wash hands thoroughly after handling.

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P270 Do not eat, drink or smoke when using this product.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P273 Avoid release to the environment.

Response:

P370+P380 In case of fire: Evacuate area.
P372 Explosion risk in case of fire.
P373 DO NOT fight fire when fire reaches explosives.
P301+P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
P330 Rinse mouth.
P302+P352 IF ON SKIN: Wash with plenty of soap and water.
P321 Specific treatment (see First Aid Measures on the Safety Data Sheet).
P332+P313 If skin irritation occurs: Get medical advice/attention.
P362 Take off contaminated clothing before re-use.
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 advice/attention.
P314 Get medical advice/attention if you feel unwell.

Storage:

P401 Store in accordance with Hazardous Substances (Class 1 to 5) Control Regulations 2001.

Disposal:

P501 In case of a substance that is in compliance with a HSNO approval other than a Part 6A (Group Standards) approval, a label must provide a description of one or more appropriate and achievable methods for the disposal of a substance in accordance with the Hazardous Substances (Disposal) Regulations 2001. This may also include any method of disposal that must be avoided.

3. COMPOSITION AND INFORMATION ON INGREDIENTS

Components	CAS Number	Proportion
Ammonium Nitrate	6484-52-2	>90%
Fuels, diesel	68334-30-5	<10%
Ingredients determined not to be hazardous	-	<1%

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 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 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.

Ingestion:

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

Indication of immediate medical attention and special treatment needed:

Explosive material. Shrapnel from detonation may cause burns, wounds and bruises - treat symptomatically. Treat symptomatically and as for exposure to hydrocarbon solvents. Treat as for exposure to nitrates. May cause

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methemoglobinemia. 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.
- 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:

Do not fight fires involving explosives.

Hazchem or Emergency Action Code: E

Specific hazards arising from the substance or mixture:

Explosive material. Avoid all ignition sources. 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.

Special protective equipment and precautions for fire-fighters:

In case of a small fire, if actual explosive is not burning, carefully remove as much explosive as possible to a safe distance. Fire fighters to wear self-contained breathing apparatus if risk of exposure to vapour or products of combustion. However, if explosive is burning, evacuate area immediately. Do NOT fight fire. On burning under confined or semi-confined conditions, some oxides of nitrogen and/or carbon monoxide will be present. Brown fumes indicate the presence of toxic oxides of nitrogen.

A major fire may involve a risk of explosion. An adjacent detonation may also involve the risk of explosion. Mass explosion hazard.

6. ACCIDENTAL RELEASE MEASURES

Emergency procedures/Environmental precautions:

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. If contamination of sewers or waterways has occurred advise local emergency services.

In the case of a transport accident notify the Police, and Regulatory Authorities Phone Number (Telephone: 800 111 077)

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

Handle with care. Wear protective equipment to prevent skin and eye contact and breathing in vapours/dust. 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

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

Conditions for safe storage, including any incompatibilities: Store material in a well ventilated magazine suitably licensed for Class 1.1D Explosives. Do not store detonators in an explosives magazine. Store away from sources of heat or ignition. Store in a cool, dry, well ventilated place and out of direct sunlight. Store away from strong acids, strong alkalis, 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. Protect containers from physical damage.

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.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Workplace Exposure Standards: No value assigned for this specific material by the New Zealand Workplace Health & Safety Authority.

However, Exposure Standard(s) for decomposition product(s):

Nitrogen dioxide: WES-TWA 3 ppm, 5.6 mg/m³; WES-STEL 5 ppm, 9.4 mg/m³

WES - TWA (Workplace Exposure Standard - Time Weighted Average) - The eight-hour, time-weighted average exposure standard is designed to protect the worker from the effects of long-term exposure.

As published by the New Zealand Workplace Health & Safety Authority.

WES - TWA (Workplace Exposure Standard - Time Weighted Average) - The eight-hour, time-weighted average exposure standard is designed to protect the worker from the effects of long-term exposure.

WES - STEL (Workplace Exposure Standard - Short Term Exposure Limits) - The 15 minute average exposure standard. Applies to any 15 minute period in the working day and is designed to protect the worker against adverse effects of irritation, chronic or irreversible tissue change, or narcosis that may increase the likelihood of accidents.

The WES-STEL is not an alternative to the WES-TWA; both short-term and eight-hour, time-weighted average exposures should be determined.

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.

Supplier recommended Exposure Standard:

Fuels, diesel: 5 mg/m³ (stable aerosol) for 8 hour time-weighted average (TWA).

Fuels, diesel: 200 mg/m³ (vapour) for 8 hour time-weighted average (TWA).

Fuels, diesel: 100 mg/m³, SKIN (total hydrocarbons, inhalable) for 8 hour time-weighted average (TWA). * ACGIH Exposure Standard from supplier

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

Skin - ACGIH - The designation of 'Skin' refers to the potential significant contribution to the overall exposure by the cutaneous route, including mucous membranes and the eyes, either by contact with vapours or, of probable greater significance, by direct skin contact with the substance.

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.

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Appropriate engineering controls:

Ensure ventilation is adequate and that air concentrations of components are controlled below quoted Workplace Exposure Standards. Use in well ventilated areas.

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

Prime Blasting Personal Protection Guide information (refer to PPE section below) as a basis must be carried out to determine the minimum PPE requirements.

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. Protection Guide OVERALLS, SAFETY SHOES, CHEMICAL GOGGLES, GLOVES.



Wear overalls, chemical goggles and impervious gloves. If determined by a risk assessment an inhalation risk exists, wear an organic vapour/particulate 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 .
Colour:	Off-white or Pink
Odour:	Slight , Kerosene
Solubility:	Partially soluble in water.
Specific Gravity:	0.8 @ 20°C
Relative Vapour Density (air=1):	Not Available
Vapour Pressure (20 °C):	Not Available
Flash Point (°C):	>61
Flammability Limits (%):	Not Available
Autoignition Temperature (°C):	Not Available
Melting Point/Range (°C):	Not Available
Boiling Point/Range (°C):	Not Available
Decomposition Point (°C):	Not Available
pH:	Not Available
Viscosity:	Not Available
Evaporation Rate:	Not Available

10. STABILITY AND REACTIVITY

Reactivity: Explosive.

Chemical stability: Explosive material. Avoid shock, heat, mechanical impact, friction between hard surfaces, electrostatic discharge and impingement. Confinement of burning material could result in detonation. Avoid contact with other chemicals including strong acids, alkalis or oxidising agents. Detonation may occur from heavy impact or excessive heating, particularly under confinement.

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Possibility of hazardous reactions:	Explosive material. A major fire may involve a risk of explosion. An adjacent detonation may also involve the risk of explosion. Heating can cause expansion or decomposition of the material, which can lead to the containers exploding. Explosion may result due to shock, friction, fire and other sources of ignition. Explosion creates the potential for shrapnel.
Conditions to avoid:	Avoid exposure to heat, sources of ignition, and open flame. Avoid build up of static electricity. Avoid friction. Avoid contact with combustible substances. Avoid contact with other chemicals.
Incompatible materials:	Incompatible with nitrites, chlorates, chlorides and permanganates. Incompatible with strong acids. Incompatible with strong alkalis. Incompatible with combustible materials. Incompatible with moisture. Ammonium nitrate is a powerful oxidising agent; it is incompatible with tetranitromethane, dichloroisocyanuric acid, trichloroisocyanuric acid, bromates, chlorates, chlorites, hypochlorites, perchlorates, permanganates, chloroisocyanurate, nitrites, powdered metals.
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.

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.
Skin contact:	Contact with skin may result in irritation. Will have a degreasing action on the skin. Repeated or prolonged skin contact may lead to irritant contact dermatitis. Can be absorbed through cut, broken, or burnt skin with resultant adverse effects. See effects as noted under 'Inhalation'. Shrapnel from detonation may cause burns and wounds to the skin and eyes.
Inhalation:	Material may be irritant to the mucous membranes of the respiratory tract (airways). Breathing in vapour can result in headaches, dizziness, drowsiness, and possible nausea. 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 methaemoglobinemia.
Acute toxicity:	No LD50 data available for the product. For the constituent AMMONIUM NITRATE: Oral LD50 (rat): 2217 mg/kg.
Serious eye damage/irritation:	Irritant.
Chronic 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.

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Carcinogenicity:

For diesel: This material has been classified by the International Agency for Research on Cancer (IARC) as a Group 3 agent. The agent is not classifiable as to its carcinogenicity to humans.

Diesel fuel has been shown to be carcinogenic in animal tests and has caused mutations in vitro. Repeated dermal exposures to high concentrations in test animals resulted in reduced litter size and litter weight, and increased foetal resorptions at maternally toxic doses.

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

12. ECOLOGICAL INFORMATION

Ecotoxicity:

Avoid contaminating waterways.

Aquatic toxicity:

May cause long lasting harmful effects to aquatic life.

For diesel:

Floats on water. Spills may form a film on water surfaces causing physical damage to organisms. Oxygen transfer could also be impaired.

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.

13. DISPOSAL CONSIDERATIONS

Disposal methods:

Refer to local government authority for disposal recommendations. Dispose of contents/container in accordance with local/regional/national/international regulations.

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 Prime Blasting Services New Zealand.

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

Road and Rail Transport

Classified as a Dangerous Good according to NZS 5433:2012 Transport of Dangerous Goods on Land.



UN No:

0082

Transport Hazard Class:

1.1 D Explosive

Proper Shipping Name or

EXPLOSIVE, BLASTING, TYPE B

Technical Name:

Hazchem or Emergency

E

Action Code:

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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: 0082
Transport Hazard Class: 1.1 D Explosive
Proper Shipping Name or Technical Name: EXPLOSIVE, BLASTING, TYPE B
IMDG EMS Fire: F-B
IMDG EMS Spill: S-Y

Air Transport

TRANSPORT PROHIBITED under the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air in Passenger and Cargo Aircraft, and Cargo Aircraft Only.

15. REGULATORY INFORMATION

Classification:

Classified as hazardous according to criteria in the HS (Minimum Degrees of Hazard) Regulations 2001.

Subclasses:

Subclass 1.1 Category D
Subclass 6.1 Category D - Substances which are acutely toxic.
Subclass 6.3 Category A - Substances that are irritating to the skin.
Subclass 6.4 Category A - Substances that are irritating to the eye.
Subclass 6.9 Category B - Substances that are harmful to human target organs or systems.
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The 'Hazardous Substances (Tracking) Regulations 2001' are applicable to this material.

Hazard Statement(s):

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H302 Harmful if swallowed.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H373 May cause damage to organs through prolonged or repeated exposure.
H413 May cause long lasting harmful effects to aquatic life.

16. OTHER INFORMATION

American Conference of Governmental and Industrial Hygienists. In: 'Threshold Limit Values and Biological Exposure Indices'. American Conference of Governmental and Industrial Hygienists Inc., 2008.
'Registry of Toxic Effects of Chemical Substances'. Ed. D. Sweet, US Dept. of Health & Human Services: Cincinnati, Supplier Safety Data Sheet; 2015.
Probe Analytical report (Flash Point Determination), Request No. 950761, June, 1995.
This safety data sheet has been prepared by Prime Blasting Services New Zealand.

Disclaimer: The information and suggestions above concern explosive products which should only be dealt with by persons having appropriate technical skills, training and licences. The results depend to a large degree on the conditions under which the products are stored, transported and used.

While Prime Explosives makes every effort to ensure the details contained in the data sheet are as current and accurate as possible the conditions under which its products are used are not within Prime Explosives control. Each user is responsible for being aware of the details in the data sheet and the product applications in the specific context of the intended use.

Buyers and users assume all risk, responsibility and liability arising from the use of this product and the information in this data sheet. Prime Explosives is not responsible for damages of any nature resulting from the use of its products or reliance upon the information. Prime Explosives makes no express or implied warranties other than those implied by mandatory legislation.

Reason(s) for Issue:

Revised Primary SDS

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