Safety Data Sheet

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name:	**PENTEX BOOSTERS**
Other name(s):	PENTEX PRIMERS
Recommended Use:	Initiating explosive charges.
Supplier:	Orica New Zealand Limited
Street Address:	Kawakawa Bay Road Papakura New Zealand
Telephone Number:	+64 9 292 1000
Facsimile:	+ 64 9 292 1100
Emergency Telephone:	0 800 734 607 (ALL HOURS)

2. HAZARDS IDENTIFICATION

Classified as a Dangerous Good according to NZS 5433:2007 Transport of Dangerous Goods on Land.

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 B - Substances which are acutely toxic.
Subclass 6.3 Category A - Substances that are irritating to the skin.
Subclass 6.9 Category B - Substances that are harmful to human target organs or systems.
Subclass 9.1 Category B - Substances that are ecotoxic in the aquatic environment.

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

Hazard and Precautionary Information:
Danger.
Explosive; mass explosion hazard. Fatal if swallowed. Fatal in contact with skin. Causes skin irritation. Fatal if inhaled. May cause damage to organs through prolonged or repeated exposure. Toxic to aquatic life with long lasting effects. Keep out of reach of children. Read label before use. Read Safety Data Sheet before use. Keep away from heat/sparks/open flames/hot surfaces. No smoking. Keep wetted with ....<specify appropriate material(s)>. Ground/bond container and receiving equipment. Do not subject to grinding/shock/friction/...<specify any other applicable type(s) of rough handling>. Do not breathe dust/fume/gas/mist/vapours/spray. Do not get in eyes, on skin, or on clothing. Wash hands thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face protection. Wear respiratory protection. IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. IF ON SKIN: Wash with plenty of soap and water. IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/physician. Get medical advice/attention if you feel unwell. Specific treatment is urgent (see First Aid Measures on this Safety Data Sheet). Specific treatment (see First Aid Measures on this Safety Data Sheet). Rinse mouth. Do NOT induce vomitting. If skin irritation occurs: Get medical advice/attention. Remove/Take off immediately all contaminated clothing. Take off contaminated clothing before re-use. Wash contaminated clothing before re-use. In case of fire: Evacuate area. Exlposion risk in case of fire. DO NOT fight fire when fire reaches explosives. Collect spillage. Store in accordance with Hazardous Substances (Class 1 to 5) Control Regulations 2001. 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/INFORMATION ON INGREDIENTS

Components	CAS Number	Proportion	Risk Phrases
Pentaerythritol tetranitrate (PETN)	78-11-5	0-60%	R3
Cyclonite (RDX, Cyclotrimethylenetrinitramine)	121-82-4	0-60%	R3, R25, R38
Trinitrotoluene (TNT)	118-96-7	35-55%	R2, R23/24/25, R33, R51/53
Ingredients determined not to be hazardous	-	<12%	-
Barium sulfate	7727-43-7	<10%	-

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 or hair contact occurs, immediately remove any contaminated clothing and wash skin and hair thoroughly with running water. A component of this material can be absorbed through the skin with resultant toxic effects. Seek immediate medical assistance. If swelling, redness, blistering or irritation occurs seek medical assistance.

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:
Immediately rinse mouth with water. If swallowed, do NOT induce vomiting. Give a glass of water. Seek immediate medical assistance.

Medical attention and special treatment:
Treat symptomatically. Explosive material. PETN is a vasodilator. Maintain blood pressure by fluid administration. 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 presense 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.

Liver and kidney damage are possible complications. Effects may be delayed.

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. On burning will emit toxic fumes, including those of oxides of sulfur .

Precautions for fire fighters and special protective equipment:
Explosive material. Avoid all ignition sources. Risk of explosion by shock, friction, fire or other sources of ignition. A major fire may involve a risk of explosion. In case of small fire where the actual explosive is not involved, carefully remove explosives to a safe distance, otherwise evacuate area immediately and allow to burn. Do NOT fight fire.

Hazchem Code: E

6. ACCIDENTAL RELEASE MEASURES

Emergency procedures:
Clear area of all unprotected personnel. Shut off all possible sources of ignition. Handle with care. Avoid friction and impact. 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).

Methods and materials for containment and clean up:
Collect with non-metallic implements. Use a spark-free shovel. Collect and seal in properly labelled containers.

7. HANDLING AND STORAGE

Precautions for safe handling: Handle with care. Avoid skin and eye contact. Do NOT subject the material to impact, friction between hard surfaces nor to any form of heating. Avoid contamination with other materials. Do not drill into explosive. Keep out of reach of children.

Conditions for safe storage: Store material in a well ventilated magazine suitably licensed for Class 1.1D Explosives. Store away from sources of heat or ignition. Store away from incompatible materials described in Section 10. Keep containers closed when not in use - check regularly for spills.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits: No value assigned for this specific material by the New Zealand Occupational Safety and Health Service (OSH). However, Workplace Exposure Standard(s) for constituent(s):

2,4,6-Trinitrotoluene: WES-TWA 0.5 mg/m^3, skin
Cyclonite: WES-TWA 1.5 mg/m^3, skin
Barium sulphate: WES-TWA 10 mg/m^3

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.

`Sk' Notice - absorption through the skin may be a significant source of exposure. The exposure standard is invalidated if such contact should occur.

As published by the New Zealand Occupational Safety and Health Service (OSH).

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.

Engineering controls:
Ensure ventilation is adequate and that air concentrations of components are controlled below quoted Exposure Standards. Keep containers closed when not in use.

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: E - OVERALLS, SAFETY SHOES, SAFETY GLASSES, GLOVES, DUST MASK.

Wear overalls, safety glasses and impervious gloves. Avoid generating and inhaling dusts. If excessive dust exists, wear 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:	Article , Solid , Cardboard or plastic tubes, with or without caps
Colour:	Tan to Brown
Odour:	Mild
Solubility:	Insoluble in water.
Specific Gravity:	1.5-1.8 @ 20°C
Flash Point (°C):	Not applicable.

10. STABILITY AND REACTIVITY

Chemical stability:	Extreme risk of explosion by shock, friction, fire or other sources of ignition. Heat, particularly under confinement, may cause a mass explosion. Detonation may occur from impact, friction, or excessive heating.
Conditions to avoid:	Avoid exposure to heat, sources of ignition, and open flame.
Incompatible materials:	Incompatible with combustible materials. Incompatible with oxidising agents. Incompatible with reducing agents. Incompatible with alkalis. Incompatible with acids.
Hazardous decomposition products:	Oxides of carbon. Oxides of nitrogen. Oxides of sulfur.
Hazardous reactions:	Explosive material. Explosion may result due to shock, friction, fire and other sources of ignition. 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, weakness, dizziness, headaches, jaundice, cyanosis, pallor, liver damage, blood effects and convulsions. May cause central nervous system effects.
Eye contact:	May be an eye irritant.
Skin contact:	Contact with skin will result in irritation. Component/s of this material can be absorbed through the skin with resultant toxic effects. See effects as noted under 'Ingestion'. May cause skin sensitisation in sensitive individuals. Repeated or prolonged skin contact may lead to allergic contact dermatitis.
Inhalation:	Breathing in dust may result in respiratory irritation. Inhalation can result in sneezing, coughing, sore throat and systemic effects like those listed under INGESTION.

Long Term Effects:
Available evidence from animal studies indicate that repeated or prolonged exposure to a component of this material could result in effects on the blood system, central nervous system, bone marrow, eye, kidneys and liver. Repeated or prolonged skin contact may cause dermatitis.

Toxicological Data: No LD50 data available for the product. For the constituent Trinitrotoluene:
Oral LD50 (rat): 795 mg/kg; 607 mg/kg (1)
Oral LD50 (mice): 660 mg/kg (1)

Oral LD50 (rat): 100 mg/kg for RDX (component of mixture)
Workers exposed to oral doses of the component RDX (unspecified amounts) have experienced convulsions, disorientation, nausea, restlessness, muscle twitching and lethargy. Rats exposed to an oral dose of 40 mg/kg/day for six months developed myocardial degeneration, blood disorders, renal dysfunction, enlarged adrenals and cataracts. (2)

For TNT, evidence from studies on exposed workers has shown increased incidences of catarats following chronic exposure. Blood effects observed in exposed workers include aplastic anaemia, leucocytosis, leucopenia and methaemoglobinaemia. 2,4,6-Trinitrotoluene is mutagenic in bacteria with and without metabolic activation. This material has been classified by the International Agency for Research on Cancer (IARC) as a Group 3 agent. Group 3 - The agent is not classifiable as to its carcinogenicity to humans. Data available is insufficient for an assessment to be made. (3)

PETN is absorbed slowly through the lungs and gastrointestinal tract but not appreciably through the skin. Vasodilatory agent, therefore causes dilation of the blood vessels and a reduction in blood pressure. Exposure to high doses may cause methaemoglobinaemia. Negative in AMES test for mutagenicity.

12. ECOLOGICAL INFORMATION

Ecotoxicity	Avoid contaminating waterways.
Aquatic toxicity:	Toxic to aquatic organisms. May cause long term adverse effects in the aquatic environment.

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 a Dangerous Good according to NZS 5433:2007 Transport of Dangerous Goods on Land.

UN No:	0042
Class-primary	1.1 D Explosive
Proper Shipping Name:	BOOSTERS
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:	0042
Class-primary:	1.1 D Explosive
Proper Shipping Name:	BOOSTERS

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

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 B - Substances which are acutely toxic.
Subclass 6.3 Category A - Substances that are irritating to the skin.
Subclass 6.9 Category B - Substances that are harmful to human target organs or systems.
Subclass 9.1 Category B - Substances that are ecotoxic in the aquatic environment.

The 'Hazardous Substances (Tracking) Regulations 2001' are applicable to this material.
Risk Phrase(s): R2: Risk of explosion by shock, friction, fire or other sources of ignition.
R23/24/25: Toxic by inhalation, in contact with skin and if swallowed.
R33: Danger of cumulative effects.
R38: Irritating to skin.

16. OTHER INFORMATION

(1) `Registry of Toxic Effects of Chemical Substances'. Ed. D. Sweet, US Dept. of Health & Human Services: Cincinatti, 11/ 2009.
(2) Toxicology Profile for RDX; Agency for Toxic Substances and Disease Registry; US Department of Health and Human Services; 06/1995
(3) International Agency for Research on Cancer. In: `IARC Monographs on the Evaluation of Carcinogenic Risk to Humans'. World Health Organisation, Vol 65, 1996
Material Safety Data Sheet - Orica Australia Pty Ltd; 05/ 2010.
Material Safety Data Sheet - Orica Australia Pty Ltd; 08/ 2006.

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

Reason(s) for Issue:
5 Yearly Revised Primary SDS
Change in Physical Properties

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