

Safety Data Sheet



1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name: PENTEX BOOSTERS - D, DP, MP

Recommended Use of the Chemical and Restrictions on Use Initiating explosive charges.

Supplier: Orica Australia Pty Ltd
ABN: 99 004 117 828
Street Address: 1 Nicholson Street
Melbourne 3000
Australia

Telephone Number: +61 3 9665 7111
Facsimile: +61 3 9665 7937
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 Code for the Transport of Explosives by Road and Rail; DANGEROUS GOODS.

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

Classification of the substance or mixture:

Explosives - Division 1.1
Acute Oral Toxicity - Category 3
Acute Dermal Toxicity - Category 3
Acute Inhalation Toxicity - Category 3
Specific target organ toxicity (single exposure) - Category 1
Specific target organ toxicity (repeated exposure) - Category 2
Chronic Aquatic Toxicity - Category 2

SIGNAL WORD: DANGER



Hazard Statement(s):

H201 Explosive; mass explosion hazard.
H301+H311+H331 Toxic if swallowed, in contact with skin or if inhaled.
H370 Causes damage to organs.
H373 May cause damage to organs through prolonged or repeated exposure.
H411 Toxic to aquatic life with long lasting effects.

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Precautionary Statement(s):

Prevention:

- P210 Keep away from heat / sparks / open flames / hot surfaces. No smoking.
P240 Ground container and receiving equipment.
P250 Do not subject to grinding / shock / friction / impact / electrical energy from extraneous source (lighting, static electricity, stray currents, galvanic electricity or electromagnetic radiation) or any form of heating.
P260 Do not breathe dust / vapours.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P273 Avoid release to the environment.
P280 Wear protective gloves / protective clothing / eye protection / face protection.
P264 Wash hands thoroughly after handling.

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+P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P321 Specific treatment (see First Aid Measures on Safety Data Sheet).
P330 Rinse mouth.
P302+P352 IF ON SKIN: Wash with plenty of soap and water.
P312 Call a POISON CENTER or doctor/physician if you feel unwell.
P322 Specific measures (see First Aid Measures on Safety Data Sheet).
P361 Take off immediately all contaminated clothing.
P363 Wash contaminated clothing before re-use.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P311 Call a POISON CENTER or doctor/physician.
P307+P311 IF exposed: Call a POISON CENTER or doctor/physician.
P391 Collect spillage.

Storage:

- P401 Store in accordance with AS2187.1 in a well ventilated magazine suitably licensed for Class 1.1D Explosives.
P403+P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.

Disposal:

- P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

Poisons Schedule (SUSMP): None allocated.

3. COMPOSITION AND INFORMATION ON INGREDIENTS

Components	CAS Number	Proportion	Hazard Codes
Trinitrotoluene (TNT)	118-96-7	30-80%	H201, H301 + H311 + H331, H373 H411
Cyclonite (RDX, Cyclotrimethylenetrinitramine)	121-82-4	0-70%	H201, H301, H370, H373
Cyclotetramethylenetetranitramine (HMX)	2691-41-0	0-70%	H201, H302, H311
Pentaerythritol tetranitrate (PETN)	78-11-5	0-70%	H200
Aluminium	7429-90-5	0-25%	-
Ingredients determined not to be hazardous	-	to 100%	-

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.

Product Name: PENTEX BOOSTERS - D, DP, MP
Substance No: 00000009439

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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.

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.

Indication of immediate medical attention and special treatment needed:

Treat symptomatically. Explosive material. Shrapnel from detonation may cause burns, wounds and bruises - treat symptomatically. 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 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.

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

5. FIRE FIGHTING MEASURES

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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. On burning will emit toxic fumes, including those of oxides of carbon, oxides of nitrogen and oxides of aluminium.

Special protective equipment and precautions for fire-fighters:

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. 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. Risk of explosion by shock, friction, fire or other sources of ignition.

6. ACCIDENTAL RELEASE MEASURES

Emergency procedures/Environmental precautions:

Shut off all possible sources of ignition. Clear area of all unprotected personnel. Handle with care. Avoid friction and impact. Wear protective equipment to prevent skin and eye contact and inhalation of vapours/dusts. If contamination of sewers or waterways has occurred advise local emergency services.

In the case of a transport accident notify the Police, Explosives Inspector and Orica Australia Pty Ltd (Telephone: 1800 033 111 -- 24 hour service Australia) and/or (Telephone: 0800 734 607 -- 24 hour service New Zealand).

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

Wear protective equipment to prevent skin and eye contact and breathing in vapours/dust. Contain - prevent run off into drains and waterways. Collect and seal in properly labelled containers. Handle with care. Collect with non-metallic implements. Use a spark-free shovel.

7. HANDLING AND STORAGE

Precautions for safe handling:

Keep out of reach of children. Avoid skin and eye contact and breathing in vapour/dust. Handle with care. Do NOT subject the material to impact, friction between hard surfaces nor to any form of heating. Avoid impact with solid surfaces or other boosters. Do not drill into explosive. 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 in a cool, dry, well ventilated place and out of direct sunlight. 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

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

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2,4,6-Trinitrotoluene (TNT): 8hr TWA = 0.5 mg/m³, Sk
Cyclonite: 8hr TWA = 1.5 mg/m³, Sk
Aluminium (metal dust): 8hr TWA = 10 mg/m³
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.

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

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.

Biological Exposure Indices: Biological Exposure Index (2,4,6-Trinitrotoluene, TNT)(methemoglobin inducers): Methemoglobin in blood = 1.5% of hemoglobin, During or end of shift.

Appropriate engineering controls:

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

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, SAFETY GLASSES, GLOVES, DUST MASK.



Wear overalls, safety glasses 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:	Article , Solid , Various colours . Cardboard or plastic tubes, with or without caps .
Colour:	Tan to Brown (contents) .
Odour:	Mild
Solubility:	Insoluble in water.
Specific Gravity:	1.5-1.8 @ 20°C
Relative Vapour Density (air=1):	Not available
Flash Point (°C):	Not applicable
Autoignition Temperature (°C):	Not available
Melting Point/Range (°C):	Not available
Decomposition Point (°C):	Not available
pH:	Not available
Viscosity:	Not available

10. STABILITY AND REACTIVITY

Reactivity:	Explosive.
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.
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. Hazardous polymerisation will not occur.
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. Avoid impact with solid surfaces or other boosters.
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 aluminium.

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.

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Skin contact: Contact with skin may 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. Shrapnel from detonation may cause burns and wounds to the skin and eyes.

Inhalation: Inhalation may result in headache, nausea and irritation of the respiratory tract. Inhalation may result in headache or dizziness as a result of dilation of the blood vessels and a subsequent reduction of blood pressure. Inhalation can result in sneezing, coughing, sore throat and systemic effects like those listed under INGESTION.

Acute toxicity: 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)

Chronic 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.

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 cataracts 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.

For HMX (component of mixture): LD50 (rat): 6490 mg/kg; Oral LD50 (mouse): 1500 mg/kg; Oral LD50 (rabbit): 50 mg/kg

The toxicity of HMX has been investigated in animals primarily exposed by the oral route. These studies indicate that the central nervous system and liver are primary targets of HMX toxicity following acute and intermediate exposures.

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

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Disposal methods:

Refer to Waste Management Authority. 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 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: 0042
Transport Hazard Class: 1.1 D Explosive
Proper Shipping Name or Technical Name: BOOSTERS
Hazchem or Emergency Action 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
Transport Hazard Class: 1.1 D Explosive
Proper Shipping Name or Technical Name: BOOSTERS

IMDG EMS Fire: F-B
IMDG EMS Spill: S-X

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:

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

Classification of the substance or mixture:

Explosives - Division 1.1
Acute Oral Toxicity - Category 3
Acute Dermal Toxicity - Category 3
Acute Inhalation Toxicity - Category 3
Specific target organ toxicity (single exposure) - Category 1
Specific target organ toxicity (repeated exposure) - Category 2
Chronic Aquatic Toxicity - Category 2

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Hazard Statement(s):

H201 Explosive; mass explosion hazard.

H301+H311+H331 Toxic if swallowed, in contact with skin or if inhaled.

H370 Causes damage to organs.

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

H411 Toxic to aquatic life with long lasting effects.

Poisons Schedule (SUSMP): None allocated.

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

16. OTHER INFORMATION

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

(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

Toxicology Profile for HMX; Agency for Toxic Substances and Disease Registry; US Department of Health and Human Services; 09/97

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

Reason(s) for Issue:

First Issue Primary SDS

Alignment to Safe Work Australia requirements

Alignment to HSNO requirements

Alignment to GHS requirements

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.