

SAFETY DATA SHEET

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1 Product identifier

Product name TROJAN CAST BOOSTERS
Synonyms TROJAN NB UNIVERSAL • TROJAN RINGPRIME • TROJAN SPARTAN • TROJAN SPARTAN SR • TROJAN STINGER • TROJAN TWINPLEX • TROJAN TWINPLEX B

1.2 Uses and uses advised against

Uses BLASTING APPLICATIONS • BOOSTER CHARGE

1.3 Details of the supplier of the product

Supplier name DYNO NOBEL ASIA PACIFIC LIMITED
Address 282 Paringa Rd, Gibson Island, Murarrie, QLD, 4172, AUSTRALIA
Telephone (07) 3026 3900
Fax (07) 3026 3999
Website <http://www.dynonobel.com>

1.4 Emergency telephone numbers

Emergency 1800 098 836

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

Physical Hazards

Explosives: Division 1.1

Health Hazards

Acute Toxicity: Oral: Category 3
Acute Toxicity: Skin: Category 3
Acute Toxicity: Inhalation: Category 3
Specific Target Organ Toxicity (Repeated Exposure): Category 2

Environmental Hazards

Aquatic Toxicity (Chronic): Category 2

2.2 GHS Label elements

Signal word DANGER

Pictograms



Hazard statements

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

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Prevention statements

P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P230	Keep wetted.
P240	Ground/bond container and receiving equipment.
P250	Do not subject to grinding/shock/friction/rough handling.
P260	Do not breathe dust/fume/gas/mist/vapours/spray.
P264	Wash thoroughly after handling.
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.

Response statements

P301 + P310	IF SWALLOWED: Immediately call a POISON CENTRE or doctor/physician.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P304 + P340	IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
P311	Call a POISON CENTRE or doctor/physician.
P314	Get medical advice/attention if you feel unwell.
P321	Specific treatment is advised - see first aid instructions.
P330	Rinse mouth.
P361	Remove/Take off immediately all contaminated clothing.
P363	Wash contaminated clothing before reuse.
P370 + P380	In case of fire: Evacuate area.
P372	Explosion risk in case of fire.
P373	DO NOT fight fire when fire reaches explosives.
P391	Collect spillage.

Storage statements

P401	Store in accordance with relevant site and storage provisions.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.

Disposal statements

P501	Dispose of contents/container in accordance with relevant regulations.
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2.3 Other hazards

No information provided.

3. COMPOSITION/ INFORMATION ON INGREDIENTS

3.1 Substances / Mixtures

Ingredient	CAS Number	EC Number	Content
PENTAERYTHRITOL TETRANITRATE (PETN)	78-11-5	201-084-3	<70%
CYCLOTRIMETHYLENE TRINITRAMINE (RDX)	121-82-4	204-500-1	<60%
TRINITROTOLUENE (TNT)	118-96-7	204-289-6	30 to 60%
ALUMINIUM POWDER (PYROPHORIC)	7429-90-5	231-072-3	<15%
CYCLOTETRAMETHYLENE TETRANITRAMINE (HMX)	2691-41-0	220-260-0	<10%

4. FIRST AID MEASURES

4.1 Description of first aid measures

Eye	If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.
Inhalation	If inhaled, remove from contaminated area. To protect rescuer, use an Air-line respirator where an inhalation risk exists. Apply artificial respiration if not breathing.
Skin	If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.
Ingestion	For advice, contact a Poisons Information Centre on 13 11 26 (Australia Wide) or a doctor (at once). Rinse mouth out with water and give plenty of water to drink.
First aid facilities	Eye wash facilities should be available.

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4.2 Most important symptoms and effects, both acute and delayed

See Section 11 for more detailed information on health effects and symptoms.

4.3 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. Treat as for exposure to nitrates. 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.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

DO NOT attempt to extinguish burning explosives. Evacuate area immediately. Notify trained emergency response personnel.

5.2 Special hazards arising from the substance or mixture

EXPLOSIVE. Will explode under specific conditions. May evolve toxic gases (carbon/ nitrogen oxides, hydrocarbons) when heated to decomposition. Eliminate all ignition sources including cigarettes, open flames, spark producing switches/tools, heaters, naked lights, pilot lights, etc when handling. CAUTION: Will explode if exposed to heat or with heavy impact.

5.3 Advice for firefighters

Evacuate area and contact emergency services. Toxic gases may be evolved in a fire situation. Remain upwind and notify those downwind of hazard. Do not attempt to fight fire. Use waterfog to cool intact containers and nearby storage areas. May explode from heat, pressure, friction or shock.

5.4 Hazchem code

E Evacuation of people in and around the immediate vicinity of the incident should be considered.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear Personal Protective Equipment (PPE) as detailed in section 8 of the SDS. Clear area of all unprotected personnel.

6.2 Environmental precautions

Prevent product from entering drains and waterways.

6.3 Methods of cleaning up

Contain spillage, then collect and place in suitable containers for disposal. Eliminate all sources of ignition.

6.4 Reference to other sections

See Sections 8 and 13 for exposure controls and disposal.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

7.2 Conditions for safe storage, including any incompatibilities

Store in clean, well ventilated and dry magazine licensed for Class 1.1 Explosives. Segregate from incompatible substances and foodstuffs. Ensure magazines are adequately labelled and protected from physical damage/shock or friction.

7.3 Specific end uses

No information provided.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Exposure standards

Ingredient	Reference	TWA		STEL	
		ppm	mg/m ³	ppm	mg/m ³
2,4,6-Trinitrotoluene (TNT)	SWA [AUS]	--	0.5	--	--
Aluminium & compounds	SWA [Proposed]	--	1	--	--
Aluminium (metal dust)	SWA [AUS]	--	10	--	--
Aluminium (welding fumes) (as Al)	SWA [AUS]	--	5	--	--
Aluminium, alkyls (NOC+) (as Al)	SWA [AUS]	--	2	--	--
Aluminium, pyro powders (as Al)	SWA [AUS]	--	5	--	--
Aluminium, soluble salts (as Al)	SWA [AUS]	--	2	--	--
Cyclonite	SWA [AUS]	--	1.5	--	--
Cyclonite	SWA [Proposed]	--	0.1	--	--

Biological limits

Ingredient	Determinant	Sampling Time	BEI
PENTAERYTHRITOL TETRANITRATE (PETN)	Methemoglobin in blood	During or end of shift	1.5% of hemoglobin
TRINITROTOLUENE (TNT)	Methemoglobin in blood	During or end of shift	1.5% of hemoglobin

Reference: ACGIH Biological Exposure Indices

8.2 Exposure controls

Engineering controls

Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical explosion proof extraction ventilation is recommended. Maintain dust levels below the recommended exposure standard.

PPE

- Eye / Face** Wear safety glasses.
- Hands** Wear PVC or rubber gloves.
- Body** Wear coveralls.
- Respiratory** Where an inhalation risk exists, wear a Class P1 (Particulate) respirator.



9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	TAN TO BROWN SOLID
Odour	ODOURLESS
Flammability	EXPLOSIVE
Flash point	NOT AVAILABLE
Boiling point	NOT AVAILABLE
Melting point	80°C (TNT)
Evaporation rate	NOT AVAILABLE
pH	NOT AVAILABLE
Vapour density	NOT AVAILABLE
Specific gravity	NOT AVAILABLE
Solubility (water)	INSOLUBLE
Vapour pressure	0.042 mm Hg @ 80°C (TNT)
Upper explosion limit	NOT AVAILABLE
Lower explosion limit	NOT AVAILABLE
Partition coefficient	NOT AVAILABLE
Autoignition temperature	NOT AVAILABLE

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9.1 Information on basic physical and chemical properties

Decomposition temperature	NOT AVAILABLE
Viscosity	NOT AVAILABLE
Explosive properties	NOT AVAILABLE
Oxidising properties	NOT AVAILABLE
Odour threshold	NOT AVAILABLE

9.2 Other information

Density	1.55 to 1.65 g/cc
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10. STABILITY AND REACTIVITY

10.1 Reactivity

Carefully review all information provided in sections 10.2 to 10.6.

10.2 Chemical stability

Stable under recommended conditions of storage.

10.3 Possibility of hazardous reactions

Polymerization will not occur.

10.4 Conditions to avoid

Avoid shock, friction, heavy impact, heat, sparks, open flames and other ignition sources.

10.5 Incompatible materials

May detonate if heated strongly or exposed to severe shock. Incompatible (explosively) with acids (e.g. nitric acid), metal powders, combustible materials, alkalis (e.g. sodium hydroxide), oxidising agents (e.g. hypochlorites), chloride salts, sulphur, urea, nitrites and reducing agents.

10.6 Hazardous decomposition products

May evolve toxic gases (carbon/ nitrogen oxides, hydrocarbons) when heated to decomposition.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity Toxic if swallowed, in contact with skin, or if inhaled.

Information available for the ingredients:

Ingredient	Oral LD50	Dermal LD50	Inhalation LC50
PENTAERYTHRITOL TETRANITRATE (PETN)	1660 mg/kg (rat)	--	--
CYCLOTRIMETHYLENE TRINITRAMINE (RDX)	59 mg/kg (mouse)	--	--
TRINITROTOLUENE (TNT)	660 mg/kg (mouse)	--	--
CYCLOTETRAMETHYLENE TETRANITRAMINE (HMX)	50 mg/kg (rabbit)	630 mg/kg (rabbit)	--

Skin Not classified as a skin irritant. Adverse health effects via skin contact are not anticipated. However, serious damage may result from explosive fragments.

Eye Not classified as an eye irritant. Due to product form, exposure can only occur during detonation. Serious damage may result from explosive fragments.

Sensitisation Not classified as causing skin or respiratory sensitisation.

Mutagenicity Not classified as a mutagen.

Carcinogenicity Not classified as a carcinogen.

Reproductive Not classified as a reproductive toxin.

STOT - single exposure Due to the product encapsulation, exposure to contents is not anticipated with normal use. Use safe work practices to avoid dust/fume inhalation after detonation. Toxic fumes evolved. PETN is not absorbed appreciably through the skin, but is absorbed slowly through the lungs and gastrointestinal tract, causing dilation of the blood vessels and a reduction in blood pressure. Exposure to high doses may cause breathing difficulties and methaemoglobinaemia. WARNING: May explode with shock, heat, friction or static charge. Serious damage may result from explosive fragments.

STOT - repeated exposure Contains Trinitrotoluene (TNT) which may cause damage to organs (liver, blood, bone marrow, eye, kidney and nervous system) through prolonged or repeated exposure. However, exposure to contents is unlikely.

Aspiration Not classified as causing aspiration.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxic to aquatic life with long lasting effects.

12.2 Persistence and degradability

No information provided.

12.3 Bioaccumulative potential

No information provided.

12.4 Mobility in soil

No information provided.

12.5 Other adverse effects

Trinitrotoluene (TNT) will undergo photochemical degradation, however it is toxic to bacteria which might biochemically degrade it. TNT is toxic to fish above 1.5 ppm. TNT and pentaerythritol tetranitrate (PETN) are not expected to bioconcentrate. PETN may degrade by hydrolysis.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Waste disposal

Waste must be disposed of in accordance with AS2187.2 as well as state regulatory and environmental legislation. Small quantities of damaged or deteriorated material may be destroyed by inclusion in a blast hole containing good explosives (by licensed personnel). Detonators should not be inserted into defective explosives. For large quantities, contact the manufacturer/supplier for additional information.

Legislation

Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE



	LAND TRANSPORT (ADG)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
14.1 UN Number	0042	0042	0042
14.2 Proper Shipping Name	BOOSTERS without detonator	BOOSTERS without detonator	BOOSTERS without detonator
14.3 Transport hazard class	1.1D	1.1D	1.1D
14.4 Packing Group	II	II	II

14.5 Environmental hazards

Marine Pollutant.

14.6 Special precautions for user

Hazchem code	E
GTEPG	EXP1
EmS	F-B, S-X

Other information

The environmentally hazardous substance mark is not required when transported in packages of less than 5 kg/L (UN Model Regulations: Special Provision 375; IATA: Special Provision A197; IMDG: Special Provision 969) or less than 500 kg/L by Australian Road and Rail.

15. REGULATORY INFORMATION

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15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Poison schedule	A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).
Classifications	Safework Australia criteria is based on the Globally Harmonised System (GHS) of Classification and Labelling of Chemicals.
Inventory listings	AUSTRALIA: AIC (Australian Inventory of Industrial Chemicals) All components are listed on AIC, or are exempt.

16. OTHER INFORMATION

Additional information EXPLOSIONS: Fires involving explosives or explosive mixtures may undergo further explosions and rapid propagation. Police and emergency personnel should be notified immediately. Evacuate individuals to a safe sheltered area at least 800 metres away. If possible remove vehicles and further heat and ignition sources from the area. Do not return to areas until at least one hour after fire and explosions have ceased.

EXPLOSIVES - DETONATION: If explosives are detonated on stony ground or in an area where debris is likely to become missiles, damage can be expected within 400 metres when three kilograms of explosives are detonated. For this reason it is recommended that explosives should be detonated in sand or earth that is free from stones.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as form of product, method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: form of product; frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
CNS	Central Nervous System
EC No.	EC No - European Community Number
EMS	Emergency Schedules (Emergency Procedures for Ships Carrying Dangerous Goods)
GHS	Globally Harmonized System
GTEPG	Group Text Emergency Procedure Guide
IARC	International Agency for Research on Cancer
LC50	Lethal Concentration, 50% / Median Lethal Concentration
LD50	Lethal Dose, 50% / Median Lethal Dose
mg/m ³	Milligrams per Cubic Metre
OEL	Occupational Exposure Limit
pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm	Parts Per Million
STEL	Short-Term Exposure Limit
STOT-RE	Specific target organ toxicity (repeated exposure)
STOT-SE	Specific target organ toxicity (single exposure)
SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
SWA	Safe Work Australia
TLV	Threshold Limit Value
TWA	Time Weighted Average

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Report status

This document has been compiled by RMT on behalf of the manufacturer, importer or supplier of the product and serves as their Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer, importer or supplier or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer, importer or supplier.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

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