SAFETY DATA SHEET

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1 Product identifier

Product name **ELECTRONIC DETONATORS**

Synonyms DIGISHOT ELECTRONIC DETONATOR ● DIGISHOT PLUS ELECTRONIC DETONATOR (PRODUCT CODE - DSPCU4120H) ● DIGISHOT PLUS.4G ELECTRONIC DETONATOR (PRODUCT CODES - DSP42BPC050H, DSP42BPC060H) ● DRIFTSHOT ELECTRONIC DETONATOR ● DRIFTSHOT STARTER ● GEOSHOT ELECTRONIC DETONATOR ● HOTSHOT ELECTRONIC DETONATOR ● QUICKSHOT ELECTRONIC DETONATOR ● SMARTSHOT ELECTRONIC DETONATOR

1.2 Uses and uses advised against

Uses DETONATOR ● INITIATING EXPLOSIVE CHARGE ● MINING EXPLOSIVE ● MINING INDUSTRY

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 1.4

Health Hazards

Not classified as a Health Hazard

Environmental Hazards

Not classified as an Environmental Hazard

2.2 GHS Label elements

Signal word **WARNING**

Pictograms

Hazard statements

H204 Fire or projection hazard.

Prevention statements

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P234 Keep only in original packaging.
P240 Ground and bond container and receiving equipment.
P250 Do not subject to grinding/shock/friction/rough handling.
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.

Response statements

P370 + P372 + P380 + In case of fire: Explosion risk. Evacuate area. DO NOT fight fire when fire reaches explosives.

Storage statements

P401 Store in accordance with relevant site and storage provisions.

Disposal statements

P503 Refer to manufacturer/supplier for information on disposal/recovery/recycling.

2.3 Other hazards

This is a packaged product that will not result in exposure to the explosive material under normal conditions of use. Exposure concerns are primarily with post-detonation reaction products. If released, contents of package will be hazardous.

3. COMPOSITION/ INFORMATION ON INGREDIENTS

3.1 Substances / Mixtures

Ingredient	CAS Number	EC Number	Content
6-DIAZO-2,4-DINITROCYCLOHEXA-2,4-DIEN-1-ONE	4682-03-5	225-134-9	Not Available
LEAD AZIDE	13424-46-9	236-542-1	Not Available
NITROCELLULOSE	9004-70-0	618-392-2	Not Available
PENTAERYTHRITOL TETRANITRATE (PETN)	78-11-5	201-084-3	Not Available
NON HAZARDOUS INGREDIENTS	Not Available	Not Available	Remainder

4. FIRST AID MEASURES

4.1 Description of first aid measures

Eye Exposure is considered unlikely unless casing is damaged. Flush gently with running water. Seek medical attention if irritation develops.

Inhalation Due to product form / nature of use, an inhalation hazard is not anticipated.

Skin Exposure is considered unlikely unless casing is damaged. Gently flush affected areas with water. Seek medical attention if irritation develops.

Ingestion For advice, contact a Poisons Information Centre on 13 11 26 (Australia Wide) or a doctor (at once). Due to product form and application, ingestion is considered unlikely. However, if ingested, rinse mouth with water. Seek medical attention immediately.

First aid facilities Eye wash facilities and normal washroom facilities should be available.

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.

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/ lead oxides) when heated to decomposition or detonated. 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. Exposure to heat may result in detonation, however effects are expected to be limited to the package. Toxic gases may be evolved in a fire situation. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. Do not attempt to fight fire if other explosives are present. Use waterfog to cool unexploded cartridges.

5.4 Hazchem code

1YE

1 Coarse Water Spray.

Y Risk of violent reaction or explosion. Wear full fire kit and breathing apparatus. Contain spill and run-off.

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

Clear area of all unprotected personnel. Contact emergency services where appropriate. CAUTION: May detonate if exposed to heat, friction or shock.

6.2 Environmental precautions

Prevent product from entering drains and waterways.

6.3 Methods of cleaning up

If spilt/ containers damaged (bulk), contact emergency services where appropriate. Clear area of all unprotected personnel. Eliminate all sources of ignition. Only trained personnel should undertake clean up.

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 a clean, dry magazine licensed for detonators. Detonators should not be stored with explosives. Store removed from incompatible materials and heat or ignition sources. Ensure the magazine is adequately placarded. Large storage areas should have appropriate ventilation and fire protection systems.

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/m³	ppm	mg/m³
Lead, inorganic dusts & fumes (as Pb)	SWA [AUS]	--	0.05	--	--

Biological limits

Ingredient	Determinant	Sampling Time	BEI
PENTAERYTHRITOL TETRANITRATE (PETN)	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. When testing detonators, explosion proof mechanical extraction ventilation may be required in poorly ventilated areas.

PPE

Eye / Face	Wear safety glasses.
Hands	Wear PVC or rubber gloves.
Body	Wear coveralls.
Respiratory	Not required under normal conditions of use.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	COPPER TUBE WITH A COLOURED WIRING HARNESS
Odour	ODOURLESS
Flammability	EXPLOSIVE
Flash point	NOT AVAILABLE
Boiling point	NOT AVAILABLE
Melting point	NOT AVAILABLE
Evaporation rate	NOT AVAILABLE
pH	NOT AVAILABLE
Vapour density	NOT AVAILABLE
Relative density	NOT AVAILABLE
Solubility (water)	INSOLUBLE
Vapour pressure	NOT AVAILABLE
Upper explosion limit	NOT AVAILABLE
Lower explosion limit	NOT AVAILABLE
Partition coefficient	NOT AVAILABLE
Autoignition temperature	100°C
Decomposition temperature	100°C
Viscosity	NOT AVAILABLE
Explosive properties	EXPLOSIVE
Oxidising properties	NOT AVAILABLE
Odour threshold	NOT AVAILABLE

10. STABILITY AND REACTIVITY

10.1 Reactivity

Reacts with incompatible materials.

10.2 Chemical stability

Explosive material. Detonation may occur from impact, friction, or excessive heating.

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. Due to enclosed form, reaction with other materials is unlikely, however avoid contact with acids (e.g. nitric acid), metal powders, combustibles and oxidisers.

10.6 Hazardous decomposition products

May evolve toxic gases (carbon/ nitrogen/ lead oxides) when heated to decomposition or detonated.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity Due to the product encapsulation, acute toxicity associated with the contents is not anticipated with normal use. Use safe work practices to avoid dust/fume inhalation after detonation. WARNING: May explode with shock, heat, friction or static charge. Serious damage may result from explosive fragments.

Information available for the ingredients:

Ingredient	Oral LD50	Dermal LD50	Inhalation LC50
NITROCELLULOSE	> 5 g/kg (rat)	--	--
PENTAERYTHRITOL TETRANITRATE (PETN)	1660 mg/kg (rat)	--	--

Skin Contact with contents/fumes may result in irritation, redness, pain, rash and dermatitis. Due to product form (enclosed), the potential for exposure to contents is not anticipated. Serious damage may result from explosive fragments.

Eye Contact with contents/fumes may cause discomfort, lacrimation and redness. Due to product form (enclosed), the potential for exposure to contents is not anticipated. Serious damage may result from explosive fragments.

Sensitisation Not classified as causing skin or respiratory sensitisation.

Mutagenicity Lead azide is suspected of causing genetic defects. Due to product form (enclosed), the potential for exposure to contents is not anticipated.

Carcinogenicity Lead compounds (inorganic) are classified as probably carcinogenic to humans (IARC Group 2A). Due to product form (enclosed), the potential for exposure to contents is not anticipated.

Reproductive There is sufficient data to indicate that lead compounds may damage fertility or the unborn child.

STOT - single exposure Not classified as causing organ damage from single exposure. However, serious damage may result from explosive fragments.

STOT - repeated exposure Lead is a cumulative poison, and symptoms are often delayed. Repeated exposure may result in lead poisoning. Symptoms may include blood, kidney and central nervous system/brain damage. Due to product form (enclosed), the potential for exposure to contents is not anticipated.

Aspiration This product does not present an aspiration hazard.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

The contents of this product may be hazardous to the environment.

12.2 Persistence and degradability

This product is not readily biodegradable.

12.3 Bioaccumulative potential

No information provided.

12.4 Mobility in soil

No information provided.

12.5 Other adverse effects

No information provided.

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	0255	0255	0255
14.2 Proper Shipping Name	DETONATORS, ELECTRIC for blasting	DETONATORS, ELECTRIC for blasting	DETONATORS, ELECTRIC for blasting
14.3 Transport hazard class	1.4B	1.4B	1.4B
14.4 Packing Group	None allocated.	None allocated.	None allocated.

14.5 Environmental hazards

Not a Marine Pollutant.

14.6 Special precautions for user

Hazchem code	1YE
GTEPG	EXP2
EmS	F-B, S-X

15. REGULATORY INFORMATION

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 Safe Work Australia criteria is based on the Globally Harmonised System (GHS) of Classification and Labelling of Chemicals (GHS Revision 7).

Inventory listings **AUSTRALIA: AIIC (Australian Inventory of Industrial Chemicals)**
All components are listed on AIIC, or are exempt.

16. OTHER INFORMATION

Additional information

DISCLAIMER: The information provided herein concern explosive products which should only be handled by persons having the appropriate technical expertise, training, and licence(s). The result is largely dependent upon the conditions of storage, transportation and use.

Whilst Dyno Nobel Asia Pacific make every effort to ensure the information contained within this SDS is as accurate and up-to-date as possible, the conditions under which its products are used are not within Dyno Nobel Asia Pacific's control. Each user has the responsibility to ensure awareness of the details contained within this SDS, the product applications, and the specific context of the intended usage. Buyers and users assume all risk, responsibility and liability arising from the use of this product and the information within this SDS. Dyno Nobel Asia Pacific is not responsible for damages of any nature resulting from the use of its products or reliance upon the information. Dyno Nobel Asia Pacific makes no express or implied warranties other than those implied mandatory by the Commonwealth, State or Territory Legislation.

EXPLOSIVES & BLASTING AGENTS: Refer to Local State and Federal legislation that specifically relates to the use of Explosives. Users of products described in this ChemAlert Report are advised to ensure familiarity and compliance with the appropriate legal requirements (e.g. Regulations) prior to the use of this product. Where any further information is required, users may contact their local authority in Explosives and Dangerous Goods.

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.

EXPLOSIONS: For further information please refer to Australian Standard 1216, for classification of explosives and Local and Federal Explosive and Dangerous Goods legislation (Act and Regulations).

EXPLOSIVES - BURNING SAFETY:
Note: Disposal in a blast with fresh explosives may be preferable to burning.
(a) Make a sawdust (or newspaper) trail 450mm wide and ~20mm deep in the direction of the wind. The trail should be 2m longer than necessary.
(b) Place the cartridges on the sawdust (or paper), they may be touching, but not piled on top of each other
(c) Individual trails should be no closer than 2m and should not contain more than 12kgs of explosives.
(d) Trails should be side by side, not in a line. No more than 4 should be set up at one time.
(e) Remove explosives not being burnt, to at least 300m away, unless the material can be stored behind something substantial.
(f) Thoroughly wet the trail with kerosene or diesel (never petrol or any other highly flammable liquid). Use at least 2L of fuel per 10m of trail.
(g) Light the trail from a long rolled paper wick, place down wind and contact the 2m of trail which is not covered by explosives. The flame should blow away from the unburned explosives otherwise preheating and detonation may occur.
(g) Use a plastic igniter if available instead of paper. Coil one end into the sawdust or under the paper and light the other end from a minimum distance of 7m away from the trail.
(h) Move away at least 300m. Do not return for a period of at least 30mins after burning has finished.
(j) If the fire goes out, do not approach for at least 15mins. Do not add kerosene or diesel oil unless certain that the flame is completely extinguished.
(k) Bury the residue as it is poisonous to livestock.

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/m³	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

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.

Prepared by

Risk Management Technologies
5 Ventnor Ave, West Perth
Western Australia 6005
Phone: +61 8 9322 1711
Fax: +61 8 9322 1794
Email: info@rmt.com.au
Web: www.rmtglobal.com

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