

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and
GHS



Printing date 21.03.2014

Revision: 19.03.2014

1 Identification of the substance/mixture and of the company/undertaking

- **1.1 Product identifier**
- **Trade name: Electric Detonators, Division 1.4**
- **1.2 Relevant identified uses of the substance or mixture and uses advised against**
No further relevant information available.
- **Application of the substance / the mixture** Explosive product.
- **1.3 Details of the supplier of the Safety Data Sheet**
- **Manufacturer/Supplier:**
Owen Oil Tools LP
12001 County Road 1000
P.O. Box 765
Godley, TX 76044 USA
Phone: (817) 551-0660
- **1.4 Emergency telephone number:**
ChemTel Inc.
(800)255-3924, +1 (813)248-0585

2 Hazards identification

- **2.1 Classification of the substance or mixture**
- **Classification according to Regulation (EC) No 1272/2008**
The following Hazard Statements are applicable only to the EU regulations and not the US GHS regulation: H411.
-  exploding bomb
Expl. 1.4 H204 Fire or projection hazard.
-  environment
Aquatic Chronic 2 H411 Toxic to aquatic life with long lasting effects.
- **Classification according to Directive 67/548/EEC or Directive 1999/45/EC**
R5-44: Heating may cause an explosion. Risk of explosion if heated under confinement.
- **Information concerning particular hazards for human and environment:**
The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.
- **Classification system:**
The classification is according to the latest editions of the EU-lists, and extended by company and literature data.
The classification is in accordance with the latest editions of international substances lists, and is supplemented by information from technical literature and by information provided by the company.
- **2.2 Label elements**
- **Labelling according to Regulation (EC) No 1272/2008**
The following Hazard Statements are applicable only to the EU regulations and not the US GHS regulation: H411.

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The product is classified and labelled according to the CLP regulation.

· **Hazard pictograms**



This pictogram only applicable for EU regulations. Not for use in the United States (OSHA GHS).



GHS01 GHS09

· **Signal word** Warning

· **Hazard statements**

The following Hazard Statements are applicable only to the EU regulations and not the US GHS regulation: H411.

H204 Fire or projection hazard.

H411 Toxic to aquatic life with long lasting effects.

· **Precautionary statements**

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

P250 Do not subject to grinding/shock/friction.

P280 Wear face protection.

P273 Avoid release to the environment.

P371+P380+P375 In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.

P401 Store in accordance with local/regional/national/international regulations.

· **Hazard description:**

· **WHMIS-symbols:**

F - Dangerously reactive material



· **NFPA ratings (scale 0 - 4)**



Health = 0

Fire = 3

Reactivity = 3

· **HMIS-ratings (scale 0 - 4)**



Health = *0

Fire = 3

Reactivity = 3

Warning: Contains lead salt(s). Long-term health hazard.

· **HMIS Long Term Health Hazard Substances**

13424-46-9 | lead diazide

15245-44-0 | lead 2,4,6-trinitro-m-phenylene dioxide

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- **2.3 Other hazards**
- **Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.
- **Explosive Product Notice**




















PREVENTION OF ACCIDENTS IN THE USE OF EXPLOSIVES - The prevention of accidents in the use of explosives is a result of careful planning and observance of the best known practices. The explosives user must remember that he is dealing with a powerful force and that various devices and methods have been developed to assist him in directing this force. He should realize that this force, if misdirected, may either kill or injure both him and his fellow workers.

WARNING - All explosives are dangerous and must be carefully handled and used following approved safety procedures either by or under the direction of competent, experienced persons in accordance with all applicable federal, state, and local laws, regulations, or ordinances. If you have any questions or doubts as to how to use any explosive product, DO NOT USE IT before consulting with your supervisor, or the manufacturer, if you do not have a supervisor. If your supervisor has any questions or doubts, he should consult the manufacturer before use.

3 Composition/information on ingredients

- **3.2 Mixtures**
- **Description:** Mixture of substances listed below with nonhazardous additions.

· Dangerous components:

CAS: 7757-79-1 EINECS: 231-818-8	potassium nitrate  O R8  Ox. Sol. 2, H272	NA%
CAS: 2691-41-0 EINECS: 220-260-0	octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine  T R24;  Xn R22;  E R2  Expl. 1.1, H201  Acute Tox. 3, H301; Acute Tox. 3, H311	NA%
CAS: 121-82-4 EINECS: 204-500-1	perhydro-1,3,5-trinitro-1,3,5-triazine  T R25;  E R2  Expl. 1.1, H201  Acute Tox. 3, H301	NA%
CAS: 20062-22-0 EINECS: 243-494-5	2,2',4,4',6,6'-hexanitrostilbene  T R25;  E R2  Expl. 1.1, H201  Acute Tox. 3, H301	NA%
CAS: 78-11-5 EINECS: 201-084-3 Index number: 603-035-00-5	pentaerythritol tetranitrate  E R3  Unst. Expl., H200	NA%
CAS: 38082-89-2	2,6-bis(picrylamino)-3,5-dinitropyridine (PYX)  E R2  Expl. 1.1, H201	NA%

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CAS: 7440-44-0 EINECS: 231-153-3	carbon Xi R36/37 Eye Irrit. 2, H319; STOT SE 3, H335	NA%
CAS: 7704-34-9 EINECS: 231-722-6 Index number: 016-094-00-1	sulfur Xi R38 Skin Irrit. 2, H315	NA%
CAS: 13424-46-9 EINECS: 236-542-1 Index number: 082-003-00-7	lead diazide T Repr. Cat. 1, 3 R61; Xn R62-20/22; E R3; N R50/53 R33 Unst. Expl., H200 Repr. 1A, H360Df; STOT RE 2, H373 Aquatic Acute 1, H400; Aquatic Chronic 1, H410 Acute Tox. 4, H302; Acute Tox. 4, H332	NA%
CAS: 15245-44-0 EINECS: 239-290-0 Index number: 609-019-00-4	lead 2,4,6-trinitro-m-phenylene dioxide T Repr. Cat. 1, 3 R61; Xn R62-20/22; E R3; N R50/53 R33 Unst. Expl., H200 Repr. 1A, H360Df; STOT RE 2, H373 Aquatic Acute 1, H400; Aquatic Chronic 1, H410 Acute Tox. 4, H302; Acute Tox. 4, H332	NA%
CAS: 7429-90-5 EINECS: 231-072-3 Index number: 013-001-00-6	aluminium powder (pyrophoric) F R15-17 Pyr. Sol. 1, H250; Water-react. 2, H261	NA%

· SVHC

13424-46-9 | lead diazide

15245-44-0 | lead 2,4,6-trinitro-m-phenylene dioxide

· **Additional information:** For the wording of the listed risk phrases refer to section 16.

4 First aid measures

· **4.1 Description of first aid measures**· **General information:** Adverse health effects are not reasonably expected from normal use of product.· **After inhalation:**

Unlikely route of exposure.

Respiration of particulates is unlikely during normal usage.

Supply fresh air; consult doctor in case of complaints.

· **After skin contact:**

Immediately wash with water and soap and rinse thoroughly.

If skin irritation continues, consult a doctor.

· **After eye contact:**

Remove contact lenses if worn.

Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.

· **After swallowing:**

Rinse out mouth and then drink plenty of water.

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Do not induce vomiting; call for medical help immediately.

· **4.2 Most important symptoms and effects, both acute and delayed** Blast injury if mishandled.

· **Hazards** Danger of blast or crush-type injuries.

· **4.3 Indication of any immediate medical attention and special treatment needed**

Product may produce physical injury if mishandled. Treatment of these injuries should be based on the blast and compression effects.

5 Firefighting measures

· **5.1 Extinguishing media**

· **Suitable extinguishing agents:**

Flood area with water. If no water is available, carbon dioxide, dry chemical or earth may be used. If the fire reaches the cargo, withdraw and let fire burn.

· **For safety reasons unsuitable extinguishing agents:** None.

· **5.2 Special hazards arising from the substance or mixture**

Formation of toxic gases is possible during heating or in case of fire.

· **5.3 Advice for firefighters**

· **Protective equipment:**

Wear self-contained respiratory protective device.

Wear fully protective suit.

· **Additional information**

Cool endangered receptacles with water spray.

In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.

Eliminate all ignition sources if safe to do so.

Flammability Classification: (defined by 29 CFR 1910.1200) Explosive. Can explode under fire conditions.

Individual devices will randomly explode. Mass explosion of multiple devices is possible under certain conditions. Burning material may produce toxic and irritating vapors. In unusual cases, shrapnel may be thrown from exploding devices under containment. See 2012 Emergency response Guidebook for further information.

6 Accidental release measures

· **6.1 Personal precautions, protective equipment and emergency procedures**

Use respiratory protective device against the effects of fumes/dust/aerosol.

Keep away from ignition sources.

Remove persons from danger area.

Ensure adequate ventilation

Protect from heat.

Isolate area and prevent access.

Wear protective equipment. Keep unprotected persons away.

· **6.2 Environmental precautions:**

Do not allow to enter sewers/ surface or ground water.

Inform respective authorities in case of seepage into water course or sewage system.

· **6.3 Methods and material for containment and cleaning up:**

Pick up mechanically.

Send for recovery or disposal in suitable receptacles.

Dispose contaminated material as waste according to item 13.

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· **6.4 Reference to other sections**

- See Section 7 for information on safe handling.
- See Section 8 for information on personal protection equipment.
- See Section 13 for disposal information.

7 Handling and storage

· **7.1 Precautions for safe handling**

- Keep away from heat and direct sunlight.
- Handle with care. Avoid jolting, friction and impact.
- **Information about fire - and explosion protection:**
 - Protect from heat.
 - Prevent impact and friction.
 - Keep ignition sources away - Do not smoke.
 - Use explosion-proof apparatus / fittings and spark-proof tools.
 - Use only in explosion protected area.
 - Emergency cooling must be available in case of nearby fire.

· **7.2 Conditions for safe storage, including any incompatibilities**

· **Storage:**

· **Requirements to be met by storerooms and receptacles:**

- Use only receptacles specifically permitted for this substance/product.
- Avoid storage near extreme heat, ignition sources or open flame.

· **Information about storage in one common storage facility:**

- Store away from oxidizing agents.
- Store away from foodstuffs.

· **Further information about storage conditions:**

- Store in cool, dry conditions in well sealed receptacles.
- Protect from heat and direct sunlight.

· **7.3 Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

- **Additional information about design of technical facilities:** No further data; see item 7.

· **8.1 Control parameters**

· **Ingredients with limit values that require monitoring at the workplace:**

121-82-4 perhydro-1,3,5-trinitro-1,3,5-triazine

REL (USA)	Short-term value: 3 mg/m ³ Long-term value: 1,5 mg/m ³ Skin
TLV (USA)	Long-term value: 0,5 mg/m ³ Skin
EL (Canada)	Long-term value: 0,5 mg/m ³ Skin

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EV (Canada)	Long-term value: 0,5 mg/m ³ Skin
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13424-46-9 lead diazide

PEL (USA)	Long-term value: 0,05 mg/m ³ as Pb; See 29 CFR 1910,1025
REL (USA)	Long-term value: 0,05* mg/m ³ as Pb;*8-hr TWA; See Pocket Guide App. C
TLV (USA)	Long-term value: 0,05 mg/m ³ as Pb; BEI
EL (Canada)	Long-term value: 0,05 mg/m ³ as Pb; IARC 2A, R

15245-44-0 lead 2,4,6-trinitro-m-phenylene dioxide

EV (Canada)	Long-term value: 0,05 mg/m ³ as Pb, Skin (organic compounds)
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7429-90-5 aluminium powder (pyrophoric)

PEL (USA)	Long-term value: 15*; 15** mg/m ³ *Total dust; ** Respirable fraction
REL (USA)	Long-term value: 10* 5** mg/m ³ *Total dust **Respirable fraction
TLV (USA)	Long-term value: 1* mg/m ³ as Al; *as respirable fraction
EL (Canada)	Long-term value: 1,0 mg/m ³ metal and insoluble compounds, respirable
EV (Canada)	Long-term value: 5 mg/m ³ aluminium-containing (as aluminium)

· Ingredients with biological limit values:**13424-46-9 lead diazide**

BEI (USA)	30 µg/100 ml Medium: blood Time: not critical Parameter: Lead
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· **Additional information:** The lists valid during the making were used as basis.

· **8.2 Exposure controls**

· **Personal protective equipment:**

· **General protective and hygienic measures:**

The usual precautionary measures are to be adhered to when handling chemicals.

Keep away from foodstuffs, beverages and feed.

Immediately remove all soiled and contaminated clothing.

Wash hands before breaks and at the end of work.

Do not inhale dust / smoke / mist.

Avoid contact with the eyes.

· **Respiratory protection:**

Not required under normal conditions of use.

Use suitable respiratory protective device when high concentrations are present.

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For spills, respiratory protection may be advisable.

· **Protection of hands:**



Protective gloves

Wear protective gloves to handle contents of damaged or leaking units.

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation.

· **Material of gloves**

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

· **Penetration time of glove material**

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

· **Eye protection:**



Safety glasses

· **Body protection:** Protective work clothing

· **Limitation and supervision of exposure into the environment**

No further relevant information available.

· **Risk management measures**

See Section 7 for additional information.

Organizational measures should be in place for all activities involving this product.

9 Physical and chemical properties

· **9.1 Information on basic physical and chemical properties**

· **General Information**

· **Appearance:**

Form: Solid

Colour: Not determined.

· **Odour:** Odourless

· **Odour threshold:** Not determined.

· **pH-value:** Not applicable.

· **Change in condition**

Melting point/Melting range: Not Determined.

Boiling point/Boiling range: Undetermined.

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- **Flash point:** Not applicable.
- **Flammability (solid, gaseous):** Not determined.
- **Auto/Self-ignition temperature:** Not determined.
- **Decomposition temperature:** Not determined.
- **Self-igniting:** Product is not self-igniting.
- **Danger of explosion:** Heating may cause an explosion.
- **Explosion limits:**
 - Lower:** Not determined.
 - Upper:** Not determined.
- **Vapour pressure:** Not applicable.
- **Density:** Not determined.
- **Relative density** Not determined.
- **Vapour density** Not applicable.
- **Evaporation rate** Not applicable.
- **Solubility in / Miscibility with water:** Insoluble.
- **Partition coefficient (n-octanol/water):** Not determined.
- **Viscosity:**
 - Dynamic:** Not applicable.
 - Kinematic:** Not applicable.
- **9.2 Other information** No further relevant information available.

10 Stability and reactivity

- **10.1 Reactivity**
- **10.2 Chemical stability**
- **Thermal decomposition / conditions to be avoided:**
No decomposition if used and stored according to specifications.
- **10.3 Possibility of hazardous reactions**
Can react violently with oxygen rich (oxidizing) material. Danger of Explosion.
Exothermic reaction with acids.
Danger of explosion.
- **10.4 Conditions to avoid**
Keep ignition sources away - Do not smoke.
Store away from oxidizing agents.
Keep away from heat and direct sunlight.
Cartridge may detonate if case is punctured or severely damaged.
- **10.5 Incompatible materials:** No further relevant information available.
- **10.6 Hazardous decomposition products:**
Carbon monoxide and carbon dioxide
Nitrogen oxides

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Flammable gases/vapours
Irritant gases/vapours
Toxic metal oxide smoke

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11 Toxicological information

- **11.1 Information on toxicological effects**

- **Acute toxicity:**

- **LD/LC50 values relevant for classification:**

15245-44-0 lead 2,4,6-trinitro-m-phenylene dioxide

Oral	LD50	650 mg/kg (rat)
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- **Primary irritant effect:**

- **on the skin:** No irritant effect.

- **on the eye:** Slight irritant effect on eyes.

- **Sensitization:** No sensitizing effects known.

- **Additional toxicological information:**

When used and handled according to specifications, the product does not have any harmful effects to our experience and the information provided to us.

Normal handling of the undeployed product poses little or no health hazards, One should avoid inhalation by wearing appropriate respiratory protection when exposed to the chemical ingredients of the product above listed TLV's or when exposed to the post ignition by-products. This product is a solid material which contains the various components within a metal shell. Therefore, under normal handling of this product, no exposure to any harmful materials will occur. When the product is used, particles may be generated which may be irritating to the eyes and the respiratory tract.

12 Ecological information

- **12.1 Toxicity**

- **Aquatic toxicity:** Toxic for aquatic organisms

- **12.2 Persistence and degradability** No further relevant information available.

- **12.3 Bioaccumulative potential** May be accumulated in organism

- **12.4 Mobility in soil** No further relevant information available.

- **Ecotoxicological effects:**

- **Remark:** Harmful to algae

- **Additional ecological information:**

- **General notes:**

The product contains heavy metals. Avoid transfer into the environment. Specific preliminary treatments are necessary

Water hazard class 3 (German Regulation) (Self-assessment): extremely hazardous for water

Do not allow product to reach ground water, water course or sewage system, even in small quantities.

Danger to drinking water if even extremely small quantities leak into the ground.

Due to available data on eliminability/decomposition and bioaccumulation potential prolonged term damage of the environment can not be excluded.

- **12.5 Results of PBT and vPvB assessment**

- **PBT:** Not applicable.

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- **vPvB:** Not applicable.
- **12.6 Other adverse effects** No further relevant information available.

13 Disposal considerations

13.1 Waste treatment methods

Recommendation

Must not be disposed together with household garbage. Do not allow product to reach sewage system.
Must be specially treated adhering to official regulations.

Damaged materials pose a danger to anyone in the immediate area; consult experts for disposal of damaged products.

The user of this material has the responsibility to dispose of unused material, residues and containers in compliance with all relevant local, state and federal laws and regulations regarding treatment, storage and disposal for hazardous and nonhazardous wastes. Residual materials should be treated as hazardous.

Uncleaned packaging:

- **Recommendation:** Disposal must be made according to official regulations.
- **Recommended cleansing agents:** Water, if necessary together with cleansing agents.

14 Transport information

14.1 UN-Number

· DOT, ADR, IMDG, IATA UN0456

14.2 UN proper shipping name

· DOT, IMDG, IATA Detonators, electric for blasting
· ADR 0456, DETONATORS, ELECTRIC for blasting

14.3 Transport hazard class(es)

DOT



· Class 1.4S

· Label 1.4S

ADR, IMDG



· Class 1.4S

· Label 1.4S

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· IATA



<ul style="list-style-type: none"> · Class · Label · 14.4 Packing group · DOT, ADR, IMDG, IATA · 14.5 Environmental hazards: · Marine pollutant: · Special marking (ADR): · 14.6 Special precautions for user · EMS Number: · 14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code · Transport/Additional information: 	<p>Explosive 1.4 1.4S</p> <p>II</p> <p>No Symbol (fish and tree) Symbol (fish and tree) Not applicable. F-A,S-Q</p> <p>Not applicable.</p>
<ul style="list-style-type: none"> · ADR · Limited quantities (LQ) · Transport category · Tunnel restriction code · DOT · Remarks: 	<p>0 4 E</p> <p>US DOT PHMSA EXPLOSIVES EX-2011021337 (non-exposed Type A $\leq 0.53 \pm 0.015g$ of lead azide and HNS) US DOT PHMSA EXPLOSIVES EX-2011021338 (non-exposed Type B $\leq 0.79 \pm 0.015g$ of lead azide and HNS or $\leq 0.70 \pm 0.015g$ of lead azide and RDX) US DOT PHMSA EXPLOSIVES EX-2011021339 (non-exposed Type C $\leq 0.92 \pm 0.015g$ of lead azide and HNS) US DOT PHMSA EXPLOSIVES EX-2011021340 (non-exposed Type D $\leq 0.92 \pm 0.015g$ of lead azide and HNS) US DOT PHMSA EXPLOSIVES EX-2011021341 (non-exposed Type E $\leq 0.92 \pm 0.015g$ of lead azide and HNS) US DOT PHMSA EXPLOSIVES EX-2011021342 (non-exposed Type F $\leq 0.92 \pm 0.015g$ of lead azide and HNS) US DOT PHMSA EXPLOSIVES EX-2011021343 (non-exposed Type G $\leq 0.87 \pm 0.015g$ of lead azide and HNS) US DOT PHMSA EXPLOSIVES EX-2011021344 (non-exposed Type H $\leq 0.60 \pm 0.015g$ of black powder, lead azide) US DOT PHMSA EXPLOSIVES EX-2011070175</p>

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- (exposed Type A: $\leq 1.6 \pm 0.05\text{g}$ of lead azide and HNS)
US DOT PHMSA EXPLOSIVES EX-2011070185
(exposed Type B: $\leq 0.9 \pm 0.05\text{g}$ of lead azide and HNS)
UN0456, DETONATORS, ELECTRIC for blasting,
1.4S, II
- **UN "Model Regulation":**

15 Regulatory information

- **15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**
- **United States (USA)**
- **SARA**

- **Section 355 (extremely hazardous substances):**

None of the ingredients is listed.

- **Section 313 (Specific toxic chemical listings):**

7429-90-5 | aluminium powder (pyrophoric)

- **TSCA (Toxic Substances Control Act):**

All ingredients are listed.

- **Proposition 65 (California):**

- **Chemicals known to cause cancer:**

13424-46-9 | lead diazide

- **Chemicals known to cause reproductive toxicity for females:**

None of the ingredients is listed.

- **Chemicals known to cause reproductive toxicity for males:**

None of the ingredients is listed.

- **Chemicals known to cause developmental toxicity:**

13424-46-9 | lead diazide

15245-44-0 | lead 2,4,6-trinitro-m-phenylene dioxide

- **Carcinogenic Categories**

- **EPA (Environmental Protection Agency)**

2691-41-0 | octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine

D

121-82-4 | perhydro-1,3,5-trinitro-1,3,5-triazine

C

13424-46-9 | lead diazide

B2

- **IARC (International Agency for Research on Cancer)**

13424-46-9 | lead diazide

2A

- **TLV (Threshold Limit Value established by ACGIH)**

121-82-4 | perhydro-1,3,5-trinitro-1,3,5-triazine

A4

13424-46-9 | lead diazide

A3

7429-90-5 | aluminium powder (pyrophoric)

A4

- **NIOSH-Ca (National Institute for Occupational Safety and Health)**

None of the ingredients is listed.

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· **OSHA-Ca (Occupational Safety & Health Administration)**

None of the ingredients is listed.

· **Canada**

· **Canadian Domestic Substances List (DSL)**

All ingredients are listed.

· **Canadian Ingredient Disclosure list (limit 0.1%)**

None of the ingredients is listed.

· **Canadian Ingredient Disclosure list (limit 1%)**

7429-90-5 | aluminium powder (pyrophoric)

· **Other regulations, limitations and prohibitive regulations**

This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

· **Substances of very high concern (SVHC) according to REACH, Article 57**

13424-46-9 | lead diazide

15245-44-0 | lead 2,4,6-trinitro-m-phenylene dioxide

· **15.2 Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Relevant phrases**

H200 Unstable explosives.

H201 Explosive; mass explosion hazard.

H250 Catches fire spontaneously if exposed to air.

H261 In contact with water releases flammable gases.

H272 May intensify fire; oxidiser.

H301 Toxic if swallowed.

H302 Harmful if swallowed.

H311 Toxic in contact with skin.

H315 Causes skin irritation.

H319 Causes serious eye irritation.

H332 Harmful if inhaled.

H335 May cause respiratory irritation.

H360Df May damage the unborn child. Suspected of damaging fertility.

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

H400 Very toxic to aquatic life.

H410 Very toxic to aquatic life with long lasting effects.

R15 Contact with water liberates extremely flammable gases.

R17 Spontaneously flammable in air.

R2 Risk of explosion by shock, friction, fire or other sources of ignition.

R20/22 Harmful by inhalation and if swallowed.

R22 Harmful if swallowed.

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Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and
GHS

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- R24 Toxic in contact with skin.
- R25 Toxic if swallowed.
- R3 Extreme risk of explosion by shock, friction, fire or other sources of ignition.
- R33 Danger of cumulative effects.
- R36/37 Irritating to eyes and respiratory system.
- R38 Irritating to skin.
- R50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
- R61 May cause harm to the unborn child.
- R62 Possible risk of impaired fertility.
- R8 Contact with combustible material may cause fire.

Abbreviations and acronyms:

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

GHS: Globally Harmonized System of Classification and Labelling of Chemicals

ACGIH: American Conference of Governmental Industrial Hygienists

EINECS: European Inventory of Existing Commercial Chemical Substances

ELINCS: European List of Notified Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

NFPA: National Fire Protection Association (USA)

HMIS: Hazardous Materials Identification System (USA)

WHMIS: Workplace Hazardous Materials Information System (Canada)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

Expl. 1.1: Explosives, Division 1.1

Expl. 1.4: Explosives, Division 1.4

Unst. Expl.: Explosives, Unstable explosives

Pyr. Sol. 1: Pyrophoric Solids, Hazard Category 1

Water-react. 2: Substances and Mixtures which, in contact with water, emit flammable gases, Hazard Category 2

Ox. Sol. 2: Oxidising Solids, Hazard Category 2

Acute Tox. 3: Acute toxicity, Hazard Category 3

Acute Tox. 4: Acute toxicity, Hazard Category 4

Skin Irrit. 2: Skin corrosion/irritation, Hazard Category 2

Eye Irrit. 2: Serious eye damage/eye irritation, Hazard Category 2

Repr. 1A: Reproductive toxicity, Hazard Category 1A

STOT SE 3: Specific target organ toxicity - Single exposure, Hazard Category 3

STOT RE 2: Specific target organ toxicity - Repeated exposure, Hazard Category 2

Aquatic Acute 1: Hazardous to the aquatic environment - Acute Hazard, Category 1

Aquatic Chronic 1: Hazardous to the aquatic environment - Chronic Hazard, Category 1

Aquatic Chronic 2: Hazardous to the aquatic environment - Chronic Hazard, Category 2