

Safety Data Sheet
according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and
OSHA GHS

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

- **1.1 Product identifier**
- **Trade name: NONEL® Non-electric Delay Detonators**
- **Article number: 1122**
- **Other product identifiers:**
 - NONEL® MS
 - NONEL® EZ DET®
 - NONEL® MS ARCTIC
 - NONEL® EZTL™
 - NONEL® LP NONEL®
 - EZ DRIFTER®
 - NONEL® SL
 - NONEL® SUPER
 - NONEL® TD
 - NONEL® MS CONNECTOR
 - NONEL® TWINPLEX™
 - NONEL® STARTER
- **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.
Commercial blasting applications
- **1.3 Details of the supplier of the Safety Data Sheet**
- **Manufacturer/Supplier:**
 - Dyno Nobel Inc.
 - 2795 East Cottonwood Parkway, Suite 500
 - Salt Lake City, Utah 84121
 - Phone: 801-364-4800
 - Fax: 801-321-6703
 - E-Mail: dnna.hse@am.dynonobel.com
- **1.4 Emergency telephone number:**
 - CHEMTREC
 - 1-800-424-9300 (US/Canada)
 - +01 703-527-3887 (International)

SECTION 2: Hazards identification

- **2.1 Classification of the substance or mixture**
- **Classification according to Regulation (EC) No 1272/2008**
Classifications listed also are applicable to the OSHA GHS Hazard Communication Standard (29CFR1910.1200).



exploding bomb

Expl. 1.1 H201 Explosive; mass explosion hazard.

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- **Classification according to Directive 67/548/EEC or Directive 1999/45/EC**

 E; Explosive

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

- **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.

- **Additional information:**

There are no other hazards not otherwise classified that have been identified.

0 percent of the mixture consists of component(s) of unknown toxicity

- **2.2 Label elements**

- **Labelling according to Regulation (EC) No 1272/2008**

The product is additionally classified and labelled according to the Globally Harmonized System within the United States (GHS).

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

- **Hazard pictograms**



GHS01

- **Signal word** Danger

- **Hazard-determining components of labelling:**

potassium perchlorate

pentaerythritol tetranitrate (PETN)

- **Hazard statements**

H201 Explosive; mass explosion hazard.

- **Precautionary statements**

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

P250 Do not subject to grinding/shock/friction.

P264 Wash thoroughly after handling.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P240 Ground/bond container and receiving equipment.

P270 Do not eat, drink or smoke when using this product.

P373 DO NOT fight fire when fire reaches explosives.

P370+P380 In case of fire: Evacuate area.

P372 Explosion risk in case of fire.

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

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

- **Additional information:**

EUH208 Contains diazodinitro phenol (DDNP). May produce an allergic reaction.

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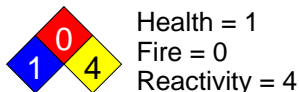
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- **Hazard description:**
- **WHMIS-symbols:**
Explosive products are not classified under WHMIS.
Not hazardous under WHMIS.
- **NFPA ratings (scale 0 - 4)**



Not available.

- **HMIS-ratings (scale 0 - 4)**



Not available

- **HMIS Long Term Health Hazard Substances**

13424-46-9	lead diazide
7439-92-1	lead
13463-67-7	titanium dioxide
7758-97-6	lead chromate
7778-74-7	potassium perchlorate

- **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.

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SECTION 3: Composition/information on ingredients


























• 3.2 Mixtures

• Description:

Mixture of substances listed below with nonhazardous additions.

Some delay periods may contain potassium perchlorate. Those that do contain between from about 4 to a maximum of approximately 60 mg perchlorate per detonator.

• Dangerous components:

CAS: 78-11-5 EINECS: 201-084-3 Index number: 603-035-00-5	pentaerythritol tetranitrate (PETN)  E R3 -----  Unst. Expl., H200
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  Carc. 1B, H350; Repr. 1A, H360Df; STOT RE 2, H373  Aquatic Acute 1, H400; Aquatic Chronic 1, H410  Acute Tox. 4, H302; Acute Tox. 4, H332
CAS: 7439-92-1 EINECS: 231-100-4	lead  T Repr. Cat. 1 R60-61-48/23/25;  N R50/53 -----  Repr. 1A, H360FD; STOT RE 1, H372  Aquatic Acute 1, H400; Aquatic Chronic 1, H410
CAS: 7440-21-3 EINECS: 231-130-8	silicon  F R11 -----  Flam. Sol. 2, H228
CAS: 7782-49-2 EINECS: 231-957-4 Index number: 034-001-00-2	selenium  T R23/25 R33-53 -----  Acute Tox. 3, H301; Acute Tox. 3, H331  STOT RE 2, H373 Aquatic Chronic 4, H413
CAS: 1314-41-6 EINECS: 215-235-6 Index number: 082-001-00-6	orange lead  T Repr. Cat. 1, 3 R61;  Xn R62-20/22;  N R50/53 R33 -----  Carc. 1B, H350; Repr. 1A, H360Df; STOT RE 2, H373  Aquatic Acute 1, H400; Aquatic Chronic 1, H410  Acute Tox. 4, H302; Acute Tox. 4, H332
CAS: 13463-67-7 EINECS: 236-675-5	titanium dioxide substance with a Community workplace exposure limit

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CAS: 10294-40-3 EINECS: 233-660-5 Index number: 056-002-00-7	barium chromate Xn R20/22 Carc. 1A, H350 Acute Tox. 4, H302; Acute Tox. 4, H332
CAS: 7758-97-6 EINECS: 231-846-0 Index number: 082-004-00-2	lead chromate T Carc. Cat. 2, Repr. Cat. 1, 3 R45-61; Xn R62; N R50/53 R33 Carc. 1B, H350; Repr. 1A, H360Df; STOT RE 2, H373 Aquatic Acute 1, H400; Aquatic Chronic 1, H410
CAS: 7727-43-7 EINECS: 231-784-4	barium sulphate, natural substance with a Community workplace exposure limit
CAS: 7778-74-7 EINECS: 231-912-9 Index number: 017-008-00-5	potassium perchlorate Xn R22; O R9 Ox. Sol. 1, H271 Acute Tox. 4, H302
CAS: 61790-53-2	Diatomaceous earth (Silica-Amorphous) substance with a Community workplace exposure limit
CAS: 7439-98-7 EINECS: 231-107-2	molybdenum substance with a Community workplace exposure limit
CAS: 7440-33-7 EINECS: 231-143-9	tungsten substance with a Community workplace exposure limit
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
CAS: 7440-36-0 EINECS: 231-146-5	antimony substance with a Community workplace exposure limit
CAS: 2691-41-0 EINECS: 220-260-0	octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX) T R24; Xn R22; E R2 Expl. 1.1, H201 Acute Tox. 3, H301; Acute Tox. 3, H311
CAS: 4682-03-5	diazodinitro phenol (DDNP) Xi R36/38; Xi R43; E R3 Unst. Expl., H200 Skin Irrit. 2, H315; Eye Irrit. 2, H319; Skin Sens. 1, H317

· **SVHC**

13424-46-9	lead diazide
1314-41-6	orange lead
7758-97-6	lead chromate

· **Additional information:**

For the listed ingredients, the identity and exact percentages are being withheld as a trade secret.
For the wording of the listed risk phrases refer to section 16.

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SECTION 4: First aid measures

· 4.1 Description of first aid measures

· **General information:**

Immediately remove any clothing soiled by the product.

Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.

· **After inhalation:**

Unlikely route of exposure.

Supply fresh air; consult doctor in case of complaints.

· **After skin contact:**

Generally the product does not irritate the skin.

Wash with soap and water.

If skin irritation is experienced, 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.

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.

Harmful if swallowed.

Danger of disturbed cardiac rhythm.

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

Medical supervision for at least 48 hours.

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

SECTION 5: Firefighting measures

· **5.1 Extinguishing media**

· **Suitable extinguishing agents:** DO NOT fight fire when fire reaches explosives.

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

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

DO NOT ATTEMPT TO FIGHT FIRES INVOLVING EXPLOSIVE MATERIALS. Evacuate all personnel to a predetermined safe location, no less than 2,500 feet in all directions. Can explode or detonate under fire conditions. Burning material may produce toxic vapors. It is recommended that users of explosives material be familiar with the Institute of Makers of Explosives Safety Library publications.

Explosive; mass explosion hazard.

· **5.3 Advice for firefighters**

· **Protective equipment:**

Wear self-contained respiratory protective device.

Wear fully protective suit.

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- **Additional information**

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.

SECTION 6: Accidental release measures

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

Remove persons from danger area.

Ensure adequate ventilation

Wear protective clothing.

Protect from heat.

Evacuate area.

Isolate area and prevent access.

- **6.2 Environmental precautions:** No special measures required.

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

Pick up mechanically.

Send for recovery or disposal in suitable receptacles.

Dispose unusable material as waste according to item 13.

- **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.

SECTION 7: Handling and storage

- **7.1 Precautions for safe handling**

Open and handle receptacle with care.

Handle with care. Avoid jolting, friction and impact.

Use only in well ventilated areas.

Do not subject to grinding/shock/friction.

- **Information about fire - and explosion protection:**

Protect from heat.

Prevent impact and friction.

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:**

Store in a cool location.

Avoid storage near extreme heat, ignition sources or open flame.

- **Information about storage in one common storage facility:** Store away from foodstuffs.

- **Further information about storage conditions:**

Store under lock and key and with access restricted to technical experts or their assistants only.

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Keep away from heat.

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

SECTION 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:**

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

7439-92-1 lead

PEL (USA)	Long-term value: 0,05* mg/m ³ *see 29 CFR 1910,1025
REL (USA)	Long-term value: 0,05* mg/m ³ *8-hr TWA,excl. lead arsenate;See PocketGuideApp.C
TLV (USA)	Long-term value: 0,05* mg/m ³ *and inorganic compounds, as Pb; BEI
EL (Canada)	Long-term value: 0,05 mg/m ³ R; IARC 2B
EV (Canada)	Long-term value: 0,05 mg/m ³ as Pb, Skin (organic compounds)

7440-21-3 silicon

PEL (USA)	Long-term value: 15* 5** mg/m ³ *total dust **respirable fraction
REL (USA)	Long-term value: 10* 5** mg/m ³ *total dust **respirable fraction
TLV (USA)	TLV withdrawn
EL (Canada)	Long-term value: 10* 3** mg/m ³ *total dust;**respirable fraction
EV (Canada)	Long-term value: 10 mg/m ³ total dust

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7782-49-2 selenium

PEL (USA)	Long-term value: 0,2 mg/m ³ as Se
REL (USA)	Long-term value: 0,2 mg/m ³ as Se
TLV (USA)	Long-term value: 0,2 mg/m ³ as Se
EL (Canada)	Long-term value: 0,1 mg/m ³
EV (Canada)	Long-term value: 0,2 mg/m ³

1314-41-6 orange lead

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
EV (Canada)	Long-term value: 0,05 mg/m ³ as Pb, Skin (organic compounds)

13463-67-7 titanium dioxide

PEL (USA)	Long-term value: 15* mg/m ³ *total dust
REL (USA)	See Pocket Guide App. A
TLV (USA)	Long-term value: 10 mg/m ³ withdrawn from NIC
EL (Canada)	Long-term value: 10* 3** mg/m ³ *total dust;**respirable fraction; IARC 2B
EV (Canada)	Long-term value: 10 mg/m ³ total dust

10294-40-3 barium chromate

PEL (USA)	Long-term value: 0,005* mg/m ³ Ceiling limit: 0,1** mg/m ³ *as Cr(VI) **as CrO ₃ ; see 29 CFR 1910,1026
REL (USA)	Long-term value: 0,0002 mg/m ³ as Cr; See Pocket Guide Apps. A and C
TLV (USA)	Long-term value: 0,01 mg/m ³ as Cr
EL (Canada)	Long-term value: 0,01 mg/m ³ as Cr; ACGIH A1 IARC 1

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7758-97-6 lead chromate

IOELV (EU)	Long-term value: 2 mg/m ³ as Cr
PEL (USA)	Long-term value: 0,005* mg/m ³ Ceiling limit: 0,1** mg/m ³ *as Cr(VI) **as CrO ₃ ; see 29 CFR 1910,1026
REL (USA)	Long-term value: 0,0002 mg/m ³ as Cr; See Pocket Guide Apps. A and C
TLV (USA)	Long-term value: 0,05* 0,012** mg/m ³ *as Pb; BEI ; **as Cr
EL (Canada)	Long-term value: 0,05* 0,012** mg/m ³ ACIGH A2, IARC 2A; R; *as Pb;**as Cr
EV (Canada)	Long-term value: 0,012* 0,05** mg/m ³ *as Cr, **as Pb

7727-43-7 barium sulphate, natural

PEL (USA)	Long-term value: 15* 5** 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: 5* mg/m ³ *inhalable fraction; E
EL (Canada)	Long-term value: 10* 3** mg/m ³ *total dust, **respirable fraction
EV (Canada)	Long-term value: 10 mg/m ³ total dust

61790-53-2 Diatomaceous earth (Silica-Amorphous)

PEL (USA)	20mppcf or 80mg/m ³ /%SiO ₂
REL (USA)	Long-term value: 6 mg/m ³ See Pocket Guide App. C
TLV (USA)	TLV withdrawn
EL (Canada)	Long-term value: 4* 1,5** mg/m ³ *total, **respirable
EV (Canada)	Long-term value: 10* 3** mg/m ³ uncalcined; *inhalable;**respirable

7439-98-7 molybdenum

PEL (USA)	Long-term value: 15* mg/m ³ *Total dust
TLV (USA)	Long-term value: 10* 3** mg/m ³ as Mo; *inhalable fraction ** respirable fraction
EL (Canada)	Long-term value: 3* 10** mg/m ³ as Mo; *respirable **inhalable

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EV (Canada)	Long-term value: 10* 3** 0,5*** mg/m ³ metal,insol.compd.:*inh;**resp;sol.compd.:***resp
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7440-33-7 tungsten

PEL (USA)	and insoluble compounds, as We
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REL (USA)	Short-term value: 10 mg/m ³ Long-term value: 5 mg/m ³ as W
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TLV (USA)	Short-term value: 10 mg/m ³ Long-term value: 5 mg/m ³ as W
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EL (Canada)	Short-term value: 10 mg/m ³ Long-term value: 5 mg/m ³ as W
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EV (Canada)	Short-term value: 10* 3** mg/m ³ Long-term value: 5* 1** mg/m ³ (as tungsten; compds.:*water-insol.;**water-sol.)
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7429-90-5 aluminium powder (pyrophoric)

PEL (USA)	Long-term value: 15*, 15** mg/m ³ *Total dust; ** Respirable fraction
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REL (USA)	Long-term value: 10* 5** mg/m ³ as Al*Total dust**Respirable/pyro powd./welding f.
-----------	--

TLV (USA)	Long-term value: 1* mg/m ³ as Al; *as respirable fraction
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EL (Canada)	Long-term value: 1,0 mg/m ³ respirable, as Al
-------------	---

EV (Canada)	Long-term value: 5 mg/m ³ aluminium-containing (as aluminium)
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7440-36-0 antimony

PEL (USA)	Long-term value: 0,5 mg/m ³ as Sb
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REL (USA)	Long-term value: 0,5 mg/m ³ as Sb
-----------	---

TLV (USA)	Long-term value: 0,5 mg/m ³ as Sb
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EL (Canada)	Long-term value: 0,5 mg/m ³
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EV (Canada)	Long-term value: 0,5 mg/m ³
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- **DNELs** No further relevant information available.
- **PNECs** No further relevant information available.

Ingredients with biological limit values:

13424-46-9 lead diazide

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BEI (USA)	30 µg/100 ml Medium: blood Time: not critical Parameter: Lead
7439-92-1 lead	
BEI (USA)	30 µg/100 ml Medium: blood Time: not critical Parameter: Lead 10 µg/100 ml Medium: blood Time: not critical Parameter: Lead (women of child bearing potential)
1314-41-6 orange lead	
BEI (USA)	30 µg/100 ml Medium: blood Time: not critical Parameter: Lead
10294-40-3 barium chromate	
BEI (USA)	25 µg/L Medium: urine Time: end of shift at end of workweek Parameter: Total chromium (fume) 10 µg/L Medium: urine Time: increase during shift Parameter: Total chromium (fume)
7758-97-6 lead chromate	
BEI (USA)	30 µg/100 ml Medium: blood Time: not critical Parameter: Lead 10 µg/100 ml Medium: blood Time: not critical Parameter: Lead (women of child bearing potential)

· **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.

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Wash hands before breaks and at the end of work.
Avoid contact with the eyes and skin.

- **Respiratory protection:**

Not required under normal conditions of use.
Respiratory protection may be required after product use.

- **Protection of hands:**

Wear gloves for the protection against mechanical hazards according to NIOSH or EN 388.

- **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

Face protection

- **Body protection:** Impervious protective clothing

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

No further relevant information available.

- **Risk management measures**

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

SECTION 9: Physical and chemical properties

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

- **General Information**

- **Appearance:**

Form: Solid material
Colour: According to product specification

- **Odour:** Characteristic

- **Odour threshold:** Not determined.

- **pH-value:** Not applicable.

- **Change in condition**

Melting point/Melting range: Not Determined.

Boiling point/Boiling range: Undetermined.

- **Flash point:** Not applicable.

- **Flammability (solid, gaseous):** Explosive; mass explosion hazard.

- **Auto/Self-ignition temperature:** Not determined.

- **Decomposition temperature:** Not determined.

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- **Self-igniting:** Product is not self-igniting.
- **Danger of explosion:** Risk of explosion by shock, friction, fire or other sources of ignition.
- **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:** Variable, dependent upon product composition and packaging.
- **Partition coefficient (n-octanol/water):** Not determined.
- **Viscosity:**
 - Dynamic:** Not applicable.
 - Kinematic:** Not applicable.
- **9.2 Other information:** No further relevant information available.

SECTION 10: Stability and reactivity

- **10.1 Reactivity**
- **10.2 Chemical stability**
- **Thermal decomposition / conditions to be avoided:**
Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
- **10.3 Possibility of hazardous reactions**
Danger of explosion.
Toxic fumes may be released if heated above the decomposition point.
- **10.4 Conditions to avoid:** No further relevant information available.
- **10.5 Incompatible materials:** No further relevant information available.
- **10.6 Hazardous decomposition products:**
Carbon monoxide and carbon dioxide
Hydrocarbons
Nitrogen oxides
Chlorine compounds
Leadoxide vapour
Bariumoxide vapour
Toxic metal oxide smoke
Danger of forming toxic pyrolysis products.

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SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity:

LD/LC50 values relevant for classification:

7439-92-1 lead

Oral | LD50 | >2000 mg/kg (rat)

7782-49-2 selenium

Oral | LD50 | 6700 mg/kg (rat)

7758-97-6 lead chromate

Oral | LD50 | 12000 mg/kg (mouse)

Primary irritant effect:

on the skin:

Not a skin irritant in unused form. Vapors/particles from used product are possibly irritating to skin.

on the eye:

Not an eye irritant in unused form. Vapors/particles from used product are possibly irritating to eyes.

Sensitisation: No sensitising effects known.

Subacute to chronic toxicity: No further relevant information available.

Additional toxicological information:

The product shows the following dangers according to the calculation method of the General EU Classification Guidelines for Preparations as issued in the latest version:

Harmful

Acute effects (acute toxicity, irritation and corrosivity):

Danger of blast or crush-type injuries.

Harmful if swallowed.

Repeated dose toxicity: No further relevant information available.

SECTION 12: Ecological information

12.1 Toxicity

Aquatic toxicity: No further relevant information available.

12.2 Persistence and degradability No further relevant information available.

12.3 Bioaccumulative potential No further relevant information available.

12.4 Mobility in soil No further relevant information available.

Additional ecological information:

General notes:

Water hazard class 1 (German Regulation) (Self-assessment): slightly hazardous for water

Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

12.5 Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

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- **12.6 Other adverse effects** No further relevant information available.

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SECTION 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. 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.

SECTION 14: Transport information

- **14.1 UN-Number**

- DOT, ADR, IMDG

UN0029

- IATA

FORBIDDEN

- **14.2 UN proper shipping name**

- DOT, IMDG

DETONATORS, NON-ELECTRIC

- ADR

0029 DETONATORS, NON-ELECTRIC

- IATA

FORBIDDEN

- **14.3 Transport hazard class(es)**

- DOT



- Class

1.1

- Label

1.1

- **ADR, IMDG**



- Class

1.1

- Label

1.1B

- IATA

- Class

FORBIDDEN

- **14.4 Packing group**

- DOT, ADR, IMDG

II

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- **IATA** FORBIDDEN
- **14.5 Environmental hazards:**
- **Marine pollutant:** Yes
- **Special marking (IATA):** FORBIDDEN BY AIR.
- **14.6 Special precautions for user** Not applicable.
- **EMS Number:** F-B,S-X
- **14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code** Not applicable.

· **Transport/Additional information:**

- **ADR**
- **Limited quantities (LQ)** 0
- **Excepted quantities (EQ)** Code: E0
Not permitted as Excepted Quantity
- **Tunnel restriction code** 1

- **IMDG**
- **Limited quantities (LQ)** 0
- **Excepted quantities (EQ)** Code: E0
Not permitted as Excepted Quantity

- **IATA** FORBIDDEN.
- **UN "Model Regulation":** UN0029, DETONATORS, NON-ELECTRIC, 1.1B, II

SECTION 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 are listed.

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

13424-46-9	lead diazide
7439-92-1	lead
7782-49-2	selenium
1314-41-6	orange lead
10294-40-3	barium chromate
7758-97-6	lead chromate
7727-43-7	barium sulphate, natural
7429-90-5	aluminium powder (pyrophoric)
7440-36-0	antimony

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

All ingredients are listed.

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· **Proposition 65 (California):**

· **Chemicals known to cause cancer:**

13424-46-9	lead diazide
7439-92-1	lead
1314-41-6	orange lead
13463-67-7	titanium dioxide
10294-40-3	barium chromate
7758-97-6	lead chromate

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

7439-92-1	lead
10294-40-3	barium chromate
7758-97-6	lead chromate

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

7439-92-1	lead
10294-40-3	barium chromate
7758-97-6	lead chromate

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

13424-46-9	lead diazide
7439-92-1	lead
10294-40-3	barium chromate
7758-97-6	lead chromate

· **Carcinogenic Categories**

· **EPA (Environmental Protection Agency)**

13424-46-9	lead diazide	B2
7439-92-1	lead	B2
7782-49-2	selenium	D
1314-41-6	orange lead	B2
10294-40-3	barium chromate	A(inh), D(oral), K/L(inh), CBD(oral)
7758-97-6	lead chromate	K
7727-43-7	barium sulphate, natural	D, CBD(inh), NL(oral)
7778-74-7	potassium perchlorate	NL
2691-41-0	octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	D

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

13424-46-9	lead diazide	2A
7439-92-1	lead	2B
7782-49-2	selenium	3
1314-41-6	orange lead	2A
13463-67-7	titanium dioxide	2B

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10294-40-3	barium chromate	1
7758-97-6	lead chromate	1
61790-53-2	Diatomaceous earth (Silica-Amorphous)	3

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

13424-46-9	lead diazide	A3
7439-92-1	lead	A3
1314-41-6	orange lead	A3
13463-67-7	titanium dioxide	A4
10294-40-3	barium chromate	A1
7758-97-6	lead chromate	A2
7439-98-7	molybdenum	A3
7429-90-5	aluminium powder (pyrophoric)	A4

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

13463-67-7	titanium dioxide
10294-40-3	barium chromate
7758-97-6	lead chromate

· **Canada**

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

Some components are listed on the NDSL.

All ingredients are listed.

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

7439-92-1	lead
7782-49-2	selenium
10294-40-3	barium chromate
7758-97-6	lead chromate

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

7439-98-7	molybdenum
7440-33-7	tungsten
7429-90-5	aluminium powder (pyrophoric)
7440-36-0	antimony

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

This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the SDS 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
1314-41-6	orange lead
7758-97-6	lead chromate

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

SECTION 16: Other information

Disclaimer

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· Relevant phrases

H200	Unstable explosives.
H201	Explosive; mass explosion hazard.
H228	Flammable solid.
H250	Catches fire spontaneously if exposed to air.
H261	In contact with water releases flammable gases.
H271	May cause fire or explosion; strong oxidiser.
H301	Toxic if swallowed.
H302	Harmful if swallowed.
H311	Toxic in contact with skin.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H331	Toxic if inhaled.
H332	Harmful if inhaled.
H350	May cause cancer.
H360Df	May damage the unborn child. Suspected of damaging fertility.
H360FD	May damage fertility. May damage the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure.
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.
H413	May cause long lasting harmful effects to aquatic life.
R11	Highly flammable.
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.
R23/25	Toxic by inhalation and if swallowed.
R24	Toxic in contact with skin.

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- R3 Extreme risk of explosion by shock, friction, fire or other sources of ignition.
- R33 Danger of cumulative effects.
- R36/38 Irritating to eyes and skin.
- R43 May cause sensitisation by skin contact.
- R45 May cause cancer.
- R48/23/25 Toxic: danger of serious damage to health by prolonged exposure through inhalation and if swallowed.
- R50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
- R53 May cause long-term adverse effects in the aquatic environment.
- R60 May impair fertility.
- R61 May cause harm to the unborn child.
- R62 Possible risk of impaired fertility.
- R9 Explosive when mixed with combustible material.

• **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 Harmonised 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)

HMS: Hazardous Materials Identification System (USA)

WHMIS: Workplace Hazardous Materials Information System (Canada)

DNEL: Derived No-Effect Level (REACH)

PNEC: Predicted No-Effect Concentration (REACH)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

Expl. 1.1: Explosives, Division 1.1

Unst. Expl.: Explosives, Unstable explosives

Flam. Sol. 2: Flammable solids, Hazard Category 2

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. 1: Oxidising Solids, Hazard Category 1

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

Skin Sens. 1: Sensitisation - Skin, Hazard Category 1

Carc. 1A: Carcinogenicity, Hazard Category 1A

Carc. 1B: Carcinogenicity, Hazard Category 1B

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

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

STOT RE 1: Specific target organ toxicity - Repeated exposure, Hazard Category 1

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 4: Hazardous to the aquatic environment - Chronic Hazard, Category 4

• **Sources**

SDS Prepared by:
ChemTel Inc.
1305 North Florida Avenue

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Tampa, Florida USA 33602-2902
Toll Free North America 1-888-255-3924 Intl. +01 813-248-0573
Website: www.chemtelinc.com

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

- **1.1 Product identifier**
- **Trade name: NONEL® Non-electric Delay Detonators**
- **Article number: 1122**
- **Other product identifiers:**
 - NONEL® MS
 - NONEL® EZ DET®
 - NONEL® MS ARCTIC
 - NONEL® EZTL™
 - NONEL® LP NONEL®
 - EZ DRIFTER®
 - NONEL® SL
 - NONEL® SUPER
 - NONEL® TD
 - NONEL® MS CONNECTOR
 - NONEL® TWINPLEX™
 - NONEL® STARTER
- **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.
Commercial blasting applications
- **1.3 Details of the supplier of the Safety Data Sheet**
- **Manufacturer/Supplier:**
Dyno Nobel Inc.
2795 East Cottonwood Parkway, Suite 500
Salt Lake City, Utah 84121
Phone: 801-364-4800
Fax: 801-321-6703
E-Mail: dnna.hse@am.dynonobel.com
- **1.4 Emergency telephone number:**
CHEMTREC
1-800-424-9300 (US/Canada)
+01 703-527-3887 (International)

SECTION 2: Hazards identification

- **2.1 Classification of the substance or mixture**
- **Classification according to Regulation (EC) No 1272/2008**
Classifications listed also are applicable to the OSHA GHS Hazard Communication Standard (29CFR1910.1200).



exploding bomb

Expl. 1.1 H201 Explosive; mass explosion hazard.

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- **Classification according to Directive 67/548/EEC or Directive 1999/45/EC**

 Xn; Harmful

R22: Harmful if swallowed.

 E; Explosive

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

- **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.

- **Additional information:**

There are no other hazards not otherwise classified that have been identified.

0 percent of the mixture consists of component(s) of unknown toxicity

- **2.2 Label elements**

- **Labelling according to Regulation (EC) No 1272/2008**

The product is additionally classified and labelled according to the Globally Harmonized System within the United States (GHS).

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

- **Hazard pictograms**



GHS01

- **Signal word** Danger

- **Hazard-determining components of labelling:**

potassium perchlorate

pentaerythritol tetranitrate (PETN)

- **Hazard statements**

H201 Explosive; mass explosion hazard.

- **Precautionary statements**

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

P250 Do not subject to grinding/shock/friction.

P264 Wash thoroughly after handling.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P240 Ground/bond container and receiving equipment.

P270 Do not eat, drink or smoke when using this product.

P373 DO NOT fight fire when fire reaches explosives.

P370+P380 In case of fire: Evacuate area.

P372 Explosion risk in case of fire.

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

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

· **Additional information:**

EUH208 Contains diazodinitro phenol (DDNP). May produce an allergic reaction.

· **Hazard description:**

· **WHMIS-symbols:** Explosive products are not classified under WHMIS.

· **NFPA ratings (scale 0 - 4)** Not available.

· **HMIS-ratings (scale 0 - 4)** Not available

· **HMIS Long Term Health Hazard Substances**

13424-46-9	lead diazide
7439-92-1	lead
13463-67-7	titanium dioxide
7758-97-6	lead chromate
7778-74-7	potassium perchlorate

· **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.

SECTION 3: Composition/information on ingredients

· **3.2 Mixtures**

· **Description:**

Mixture of substances listed below with nonhazardous additions.

Some delay periods may contain potassium perchlorate. Those that do contain between from about 4 to a maximum of approximately 60 mg perchlorate per detonator.

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









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· Dangerous components:

CAS: 78-11-5 EINECS: 201-084-3 Index number: 603-035-00-5	pentaerythritol tetranitrate (PETN)  E R3 Unst. Expl., H200
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 Carc. 1B, H350; Repr. 1A, H360Df; STOT RE 2, H373 Aquatic Acute 1, H400; Aquatic Chronic 1, H410 Acute Tox. 4, H302; Acute Tox. 4, H332
CAS: 7439-92-1 EINECS: 231-100-4	lead  T Repr. Cat. 1 R60-61-48/23/25;  N R50/53 Repr. 1A, H360FD; STOT RE 1, H372 Aquatic Acute 1, H400; Aquatic Chronic 1, H410
CAS: 7440-21-3 EINECS: 231-130-8	silicon  F R11 Flam. Sol. 2, H228
CAS: 7782-49-2 EINECS: 231-957-4 Index number: 034-001-00-2	selenium  T R23/25 R33-53 Acute Tox. 3, H301; Acute Tox. 3, H331 STOT RE 2, H373 Aquatic Chronic 4, H413
CAS: 1314-41-6 EINECS: 215-235-6 Index number: 082-001-00-6	orange lead  T Repr. Cat. 1, 3 R61;  Xn R62-20/22;  N R50/53 R33 Carc. 1B, H350; Repr. 1A, H360Df; STOT RE 2, H373 Aquatic Acute 1, H400; Aquatic Chronic 1, H410 Acute Tox. 4, H302; Acute Tox. 4, H332
CAS: 13463-67-7 EINECS: 236-675-5	titanium dioxide substance with a Community workplace exposure limit
CAS: 10294-40-3 EINECS: 233-660-5 Index number: 056-002-00-7	barium chromate  Xn R20/22 Carc. 1A, H350 Acute Tox. 4, H302; Acute Tox. 4, H332
CAS: 7758-97-6 EINECS: 231-846-0 Index number: 082-004-00-2	lead chromate  T Carc. Cat. 2, Repr. Cat. 1, 3 R45-61;  Xn R62;  N R50/53 R33 Carc. 1B, H350; Repr. 1A, H360Df; STOT RE 2, H373 Aquatic Acute 1, H400; Aquatic Chronic 1, H410

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CAS: 7727-43-7 EINECS: 231-784-4	barium sulphate, natural substance with a Community workplace exposure limit
CAS: 7778-74-7 EINECS: 231-912-9 Index number: 017-008-00-5	potassium perchlorate ✘ Xn R22; 🔥 O R9 ⚠ Ox. Sol. 1, H271 ⚠ Acute Tox. 4, H302
CAS: 61790-53-2	Diatomaceous earth (Silica-Amorphous) substance with a Community workplace exposure limit
CAS: 7439-98-7 EINECS: 231-107-2	molybdenum substance with a Community workplace exposure limit
CAS: 7440-33-7 EINECS: 231-143-9	tungsten substance with a Community workplace exposure limit
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
CAS: 7440-36-0 EINECS: 231-146-5	antimony substance with a Community workplace exposure limit
CAS: 2691-41-0 EINECS: 220-260-0	octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX) ☠ T R24; ✘ Xn R22; 🚫 E R2 ⚠ Expl. 1.1, H201 ⚠ Acute Tox. 3, H301; Acute Tox. 3, H311
CAS: 4682-03-5	diazodinitro phenol (DDNP) ✘ Xi R36/38; ✘ Xi R43; 🚫 E R3 ⚠ Unst. Expl., H200 ⚠ Skin Irrit. 2, H315; Eye Irrit. 2, H319; Skin Sens. 1, H317

• **SVHC**

13424-46-9	lead diazide
1314-41-6	orange lead
7758-97-6	lead chromate

• **Additional information:**

For the listed ingredients, the identity and exact percentages are being withheld as a trade secret.
For the wording of the listed risk phrases refer to section 16.

SECTION 4: First aid measures

• **4.1 Description of first aid measures**

• **General information:**

Immediately remove any clothing soiled by the product.

Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.

• **After inhalation:**

Unlikely route of exposure.

Supply fresh air; consult doctor in case of complaints.

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- **After skin contact:**
Generally the product does not irritate the skin.
Wash with soap and water.
If skin irritation is experienced, 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.
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.
Harmful if swallowed.
Danger of disturbed cardiac rhythm.
- **4.3 Indication of any immediate medical attention and special treatment needed**
Medical supervision for at least 48 hours.
Product may produce physical injury if mishandled. Treatment of these injuries should be based on the blast and compression effects.

SECTION 5: Firefighting measures

- **5.1 Extinguishing media**
- **Suitable extinguishing agents:** DO NOT fight fire when fire reaches explosives.
- **For safety reasons unsuitable extinguishing agents:** None.
- **5.2 Special hazards arising from the substance or mixture**
DO NOT ATTEMPT TO FIGHT FIRES INVOLVING EXPLOSIVE MATERIALS. Evacuate all personnel to a predetermined safe location, no less than 2,500 feet in all directions. Can explode or detonate under fire conditions. Burning material may produce toxic vapors. It is recommended that users of explosives material be familiar with the Institute of Makers of Explosives Safety Library publications.
Explosive; mass explosion hazard.
- **5.3 Advice for firefighters**
- **Protective equipment:**
Wear self-contained respiratory protective device.
Wear fully protective suit.
- **Additional information**
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.

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SECTION 6: Accidental release measures

· 6.1 Personal precautions, protective equipment and emergency procedures

Remove persons from danger area.

Ensure adequate ventilation

Wear protective clothing.

Protect from heat.

Evacuate area.

Isolate area and prevent access.

· 6.2 Environmental precautions: No special measures required.

· 6.3 Methods and material for containment and cleaning up:

Pick up mechanically.

Send for recovery or disposal in suitable receptacles.

Dispose unusable material as waste according to item 13.

· 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.

SECTION 7: Handling and storage

· 7.1 Precautions for safe handling

Open and handle receptacle with care.

Handle with care. Avoid jolting, friction and impact.

Use only in well ventilated areas.

Do not subject to grinding/shock/friction.

· Information about fire - and explosion protection:

Protect from heat.

Prevent impact and friction.

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:

Store in a cool location.

Avoid storage near extreme heat, ignition sources or open flame.

· Information about storage in one common storage facility: Store away from foodstuffs.

· Further information about storage conditions:

Store under lock and key and with access restricted to technical experts or their assistants only.

Keep away from heat.

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

SECTION 8: Exposure controls/personal protection

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

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· 8.1 Control parameters

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

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

7439-92-1 lead

PEL (USA)	Long-term value: 0,05* mg/m ³ *see 29 CFR 1910,1025
REL (USA)	Long-term value: 0,05* mg/m ³ *8-hr TWA,excl. lead arsenate;See PocketGuideApp.C
TLV (USA)	Long-term value: 0,05* mg/m ³ *and inorganic compounds, as Pb; BEI
EL (Canada)	Long-term value: 0,05 mg/m ³ R; IARC 2B
EV (Canada)	Long-term value: 0,05 mg/m ³ as Pb, Skin (organic compounds)

7440-21-3 silicon

PEL (USA)	Long-term value: 15* 5** mg/m ³ *total dust **respirable fraction
REL (USA)	Long-term value: 10* 5** mg/m ³ *total dust **respirable fraction
TLV (USA)	TLV withdrawn
EL (Canada)	Long-term value: 10* 3** mg/m ³ *total dust;**respirable fraction
EV (Canada)	Long-term value: 10 mg/m ³ total dust

7782-49-2 selenium

PEL (USA)	Long-term value: 0,2 mg/m ³ as Se
REL (USA)	Long-term value: 0,2 mg/m ³ as Se
TLV (USA)	Long-term value: 0,2 mg/m ³ as Se
EL (Canada)	Long-term value: 0,1 mg/m ³
EV (Canada)	Long-term value: 0,2 mg/m ³

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1314-41-6 orange lead

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
EV (Canada)	Long-term value: 0,05 mg/m ³ as Pb, Skin (organic compounds)

13463-67-7 titanium dioxide

PEL (USA)	Long-term value: 15* mg/m ³ *total dust
REL (USA)	See Pocket Guide App. A
TLV (USA)	Long-term value: 10 mg/m ³ withdrawn from NIC
EL (Canada)	Long-term value: 10* 3** mg/m ³ *total dust;**respirable fraction; IARC 2B
EV (Canada)	Long-term value: 10 mg/m ³ total dust

10294-40-3 barium chromate

PEL (USA)	Long-term value: 0,005* mg/m ³ Ceiling limit: 0,1** mg/m ³ *as Cr(VI) **as CrO ₃ ; see 29 CFR 1910,1026
REL (USA)	Long-term value: 0,0002 mg/m ³ as Cr; See Pocket Guide Apps. A and C
TLV (USA)	Long-term value: 0,01 mg/m ³ as Cr
EL (Canada)	Long-term value: 0,01 mg/m ³ as Cr; ACGIH A1 IARC 1

7758-97-6 lead chromate

IOELV (EU)	Long-term value: 2 mg/m ³ as Cr
PEL (USA)	Long-term value: 0,005* mg/m ³ Ceiling limit: 0,1** mg/m ³ *as Cr(VI) **as CrO ₃ ; see 29 CFR 1910,1026
REL (USA)	Long-term value: 0,0002 mg/m ³ as Cr; See Pocket Guide Apps. A and C
TLV (USA)	Long-term value: 0,05* 0,012** mg/m ³ *as Pb; BEI ; **as Cr

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EL (Canada)	Long-term value: 0,05* 0,012** mg/m ³ ACIGH A2, IARC 2A; R; *as Pb;**as Cr
EV (Canada)	Long-term value: 0,012* 0,05** mg/m ³ *as Cr, **as Pb
7727-43-7 barium sulphate, natural	
PEL (USA)	Long-term value: 15* 5** 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: 5* mg/m ³ *inhalable fraction; E
EL (Canada)	Long-term value: 10* 3** mg/m ³ *total dust, **respirable fraction
EV (Canada)	Long-term value: 10 mg/m ³ total dust
61790-53-2 Diatomaceous earth (Silica-Amorphous)	
PEL (USA)	20mppcf or 80mg/m ³ /%SiO ₂
REL (USA)	Long-term value: 6 mg/m ³ See Pocket Guide App. C
TLV (USA)	TLV withdrawn
EL (Canada)	Long-term value: 4* 1,5** mg/m ³ *total, **respirable
EV (Canada)	Long-term value: 10* 3** mg/m ³ uncalcined; *inhalable;**respirable
7439-98-7 molybdenum	
PEL (USA)	Long-term value: 15* mg/m ³ *Total dust
TLV (USA)	Long-term value: 10* 3** mg/m ³ as Mo; *inhalable fraction ** respirable fraction
EL (Canada)	Long-term value: 3* 10** mg/m ³ as Mo; *respirable **inhalable
EV (Canada)	Long-term value: 10* 3** 0,5*** mg/m ³ metal,insol.compd.:*inh;**resp;sol.compd.:***resp
7440-33-7 tungsten	
PEL (USA)	and insoluble compounds, as We
REL (USA)	Short-term value: 10 mg/m ³ Long-term value: 5 mg/m ³ as W

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TLV (USA)	Short-term value: 10 mg/m ³ Long-term value: 5 mg/m ³ as W
EL (Canada)	Short-term value: 10 mg/m ³ Long-term value: 5 mg/m ³ as W
EV (Canada)	Short-term value: 10* 3** mg/m ³ Long-term value: 5* 1** mg/m ³ (as tungsten; compds.: *water-insol.; **water-sol.)

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 as Al*Total dust**Respirable/pyro powd./welding f.
TLV (USA)	Long-term value: 1* mg/m ³ as Al; *as respirable fraction
EL (Canada)	Long-term value: 1,0 mg/m ³ respirable, as Al
EV (Canada)	Long-term value: 5 mg/m ³ aluminium-containing (as aluminium)

7440-36-0 antimony

PEL (USA)	Long-term value: 0,5 mg/m ³ as Sb
REL (USA)	Long-term value: 0,5 mg/m ³ as Sb
TLV (USA)	Long-term value: 0,5 mg/m ³ as Sb
EL (Canada)	Long-term value: 0,5 mg/m ³
EV (Canada)	Long-term value: 0,5 mg/m ³

- **DNELs** No further relevant information available.
- **PNECs** No further relevant information available.

· 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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7439-92-1 lead

BEI (USA)	30 µg/100 ml Medium: blood Time: not critical Parameter: Lead
	10 µg/100 ml Medium: blood Time: not critical Parameter: Lead (women of child bearing potential)

1314-41-6 orange lead

BEI (USA)	30 µg/100 ml Medium: blood Time: not critical Parameter: Lead
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10294-40-3 barium chromate

BEI (USA)	25 µg/L Medium: urine Time: end of shift at end of workweek Parameter: Total chromium (fume)
	10 µg/L Medium: urine Time: increase during shift Parameter: Total chromium (fume)

7758-97-6 lead chromate

BEI (USA)	30 µg/100 ml Medium: blood Time: not critical Parameter: Lead
	10 µg/100 ml Medium: blood Time: not critical Parameter: Lead (women of child bearing potential)

· **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.

Avoid contact with the eyes and skin.

· **Respiratory protection:**

Not required under normal conditions of use.

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Respiratory protection may be required after product use.

- **Protection of hands:**

Wear gloves for the protection against mechanical hazards according to NIOSH or EN 388.

- **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

Face protection

- **Body protection:** Impervious protective clothing

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

No further relevant information available.

- **Risk management measures**

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

SECTION 9: Physical and chemical properties

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

- **General Information**

- **Appearance:**

Form:

Solid material

Colour:

According to product specification

- **Odour:**

Characteristic

- **Odour threshold:**

Not determined.

- **pH-value:**

Not applicable.

- **Change in condition**

Melting point/Melting range:

Not Determined.

Boiling point/Boiling range:

Undetermined.

- **Flash point:**

Not applicable.

- **Flammability (solid, gaseous):**

Explosive; mass explosion hazard.

- **Auto/Self-ignition temperature:**

Not determined.

- **Decomposition temperature:**

Not determined.

- **Self-igniting:**

Product is not self-igniting.

- **Danger of explosion:**

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

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- **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:** Variable, dependent upon product composition and packaging.
- **Partition coefficient (n-octanol/water):** Not determined.
- **Viscosity:**
 - Dynamic:** Not applicable.
 - Kinematic:** Not applicable.
- **9.2 Other information:** No further relevant information available.

SECTION 10: Stability and reactivity

- **10.1 Reactivity**
- **10.2 Chemical stability**
- **Thermal decomposition / conditions to be avoided:**
Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
- **10.3 Possibility of hazardous reactions**
Danger of explosion.
Toxic fumes may be released if heated above the decomposition point.
- **10.4 Conditions to avoid** No further relevant information available.
- **10.5 Incompatible materials:** No further relevant information available.
- **10.6 Hazardous decomposition products:**
Carbon monoxide and carbon dioxide
Hydrocarbons
Nitrogen oxides
Chlorine compounds
Leadoxide vapour
Bariumoxide vapour
Toxic metal oxide smoke
Danger of forming toxic pyrolysis products.

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SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity:

LD/LC50 values relevant for classification:

7439-92-1 lead

Oral | LD50 | >2000 mg/kg (rat)

7782-49-2 selenium

Oral | LD50 | 6700 mg/kg (rat)

7758-97-6 lead chromate

Oral | LD50 | 12000 mg/kg (mouse)

Primary irritant effect:

on the skin:

Not a skin irritant in unused form. Vapors/particles from used product are possibly irritating to skin.

on the eye:

Not an eye irritant in unused form. Vapors/particles from used product are possibly irritating to eyes.

Sensitisation: No sensitising effects known.

Subacute to chronic toxicity: No further relevant information available.

Additional toxicological information:

The product shows the following dangers according to the calculation method of the General EU Classification Guidelines for Preparations as issued in the latest version:

Harmful

Acute effects (acute toxicity, irritation and corrosivity):

Danger of blast or crush-type injuries.

Harmful if swallowed.

Repeated dose toxicity: No further relevant information available.

SECTION 12: Ecological information

12.1 Toxicity

Aquatic toxicity: No further relevant information available.

12.2 Persistence and degradability No further relevant information available.

12.3 Bioaccumulative potential No further relevant information available.

12.4 Mobility in soil No further relevant information available.

Additional ecological information:

General notes:

Water hazard class 1 (German Regulation) (Self-assessment): slightly hazardous for water

Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

12.5 Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

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- **12.6 Other adverse effects** No further relevant information available.

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SECTION 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. 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.

SECTION 14: Transport information

· **14.1 UN-Number**

· DOT, ADR, IMDG

UN0360

· IATA

FORBIDDEN

· **14.2 UN proper shipping name**

· DOT, IMDG

DETONATOR ASSEMBLIES, NON-ELECTRIC

· ADR

0360 DETONATOR ASSEMBLIES, NON-ELECTRIC

· IATA

FORBIDDEN

· **14.3 Transport hazard class(es)**

· DOT



· Class

1.1

· Label

1.1

· **ADR, IMDG**



· Class

1.1

· Label

1.1B

· IATA

· Class

FORBIDDEN

· **14.4 Packing group**

· DOT, ADR, IMDG

II

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· IATA	FORBIDDEN
· 14.5 Environmental hazards:	
· Marine pollutant:	No
· Special marking (IATA):	FORBIDDEN BY AIR.
· 14.6 Special precautions for user	Not applicable.
· EMS Number:	F-B,S-X
· Segregation groups	Perchlorates
· 14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	Not applicable.
· Transport/Additional information:	

· ADR	
· Limited quantities (LQ)	0
· Excepted quantities (EQ)	Code: E0 Not permitted as Excepted Quantity
· Tunnel restriction code	1

· IMDG	
· Limited quantities (LQ)	0
· Excepted quantities (EQ)	Code: E0 Not permitted as Excepted Quantity

· IATA	FORBIDDEN.
· UN "Model Regulation":	UN0360, DETONATOR ASSEMBLIES, NON- ELECTRIC, 1.1B, II

SECTION 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 are listed.

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

13424-46-9	lead diazide
7439-92-1	lead
7782-49-2	selenium
1314-41-6	orange lead
10294-40-3	barium chromate
7758-97-6	lead chromate
7727-43-7	barium sulphate, natural
7429-90-5	aluminium powder (pyrophoric)
7440-36-0	antimony

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

All ingredients are listed.

· **Proposition 65 (California):**

· **Chemicals known to cause cancer:**

13424-46-9 | lead diazide

7439-92-1 | lead

1314-41-6 | orange lead

13463-67-7 | titanium dioxide

10294-40-3 | barium chromate

7758-97-6 | lead chromate

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

7439-92-1 | lead

10294-40-3 | barium chromate

7758-97-6 | lead chromate

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

7439-92-1 | lead

10294-40-3 | barium chromate

7758-97-6 | lead chromate

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

13424-46-9 | lead diazide

7439-92-1 | lead

10294-40-3 | barium chromate

7758-97-6 | lead chromate

· **Carcinogenic Categories**

· **EPA (Environmental Protection Agency)**

13424-46-9 | lead diazide

B2

7439-92-1 | lead

B2

7782-49-2 | selenium

D

1314-41-6 | orange lead

B2

10294-40-3 | barium chromate

A(inh), D(oral), K/L(inh), CBD(oral)

7758-97-6 | lead chromate

K

7727-43-7 | barium sulphate, natural

D, CBD(inh), NL(oral)

7778-74-7 | potassium perchlorate

NL

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

D

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

13424-46-9 | lead diazide

2A

7439-92-1 | lead

2B

7782-49-2 | selenium

3

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1314-41-6	orange lead	2A
13463-67-7	titanium dioxide	2B
10294-40-3	barium chromate	1
7758-97-6	lead chromate	1
61790-53-2	Diatomaceous earth (Silica-Amorphous)	3

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

13424-46-9	lead diazide	A3
7439-92-1	lead	A3
1314-41-6	orange lead	A3
13463-67-7	titanium dioxide	A4
10294-40-3	barium chromate	A1
7758-97-6	lead chromate	A2
7439-98-7	molybdenum	A3
7429-90-5	aluminium powder (pyrophoric)	A4

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

13463-67-7	titanium dioxide	
10294-40-3	barium chromate	
7758-97-6	lead chromate	

· **Canada**

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

Some components are listed on the NDSL.

All ingredients are listed.

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

7439-92-1	lead	
7782-49-2	selenium	
10294-40-3	barium chromate	
7758-97-6	lead chromate	

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

7439-98-7	molybdenum	
7440-33-7	tungsten	
7429-90-5	aluminium powder (pyrophoric)	
7440-36-0	antimony	

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

This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the SDS 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	
1314-41-6	orange lead	

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7758-97-6 | lead chromate

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

SECTION 16: Other information

Disclaimer

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· Relevant phrases

H200	Unstable explosives.
H201	Explosive; mass explosion hazard.
H228	Flammable solid.
H250	Catches fire spontaneously if exposed to air.
H261	In contact with water releases flammable gases.
H271	May cause fire or explosion; strong oxidiser.
H301	Toxic if swallowed.
H302	Harmful if swallowed.
H311	Toxic in contact with skin.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H331	Toxic if inhaled.
H332	Harmful if inhaled.
H350	May cause cancer.
H360Df	May damage the unborn child. Suspected of damaging fertility.
H360FD	May damage fertility. May damage the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure.
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.
H413	May cause long lasting harmful effects to aquatic life.
.....	
R11	Highly flammable.
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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- R23/25 Toxic by inhalation and if swallowed.
 R24 Toxic in contact with skin.
 R3 Extreme risk of explosion by shock, friction, fire or other sources of ignition.
 R33 Danger of cumulative effects.
 R36/38 Irritating to eyes and skin.
 R43 May cause sensitisation by skin contact.
 R45 May cause cancer.
 R48/23/25 Toxic: danger of serious damage to health by prolonged exposure through inhalation and if swallowed.
 R50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
 R53 May cause long-term adverse effects in the aquatic environment.
 R60 May impair fertility.
 R61 May cause harm to the unborn child.
 R62 Possible risk of impaired fertility.
 R9 Explosive when mixed with combustible material.

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 Harmonised 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)
 DNEL: Derived No-Effect Level (REACH)
 PNEC: Predicted No-Effect Concentration (REACH)
 LC50: Lethal concentration, 50 percent
 LD50: Lethal dose, 50 percent
 Expl. 1.1: Explosives, Division 1.1
 Unst. Expl.: Explosives, Unstable explosives
 Flam. Sol. 2: Flammable solids, Hazard Category 2
 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. 1: Oxidising Solids, Hazard Category 1
 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
 Skin Sens. 1: Sensitisation - Skin, Hazard Category 1
 Carc. 1A: Carcinogenicity, Hazard Category 1A
 Carc. 1B: Carcinogenicity, Hazard Category 1B
 Repr. 1A: Reproductive toxicity, Hazard Category 1A
 STOT RE 1: Specific target organ toxicity - Repeated exposure, Hazard Category 1
 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 4: Hazardous to the aquatic environment - Chronic Hazard, Category 4

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· **Sources**

SDS Prepared by:

ChemTel Inc.

1305 North Florida Avenue

Tampa, Florida USA 33602-2902

Toll Free North America 1-888-255-3924 Intl. +01 813-248-0573

Website: www.chemtelinc.com

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

- **1.1 Product identifier**
- **Trade name:** NONEL® Non-electric Delay Detonators
- **Article number:** 1122
- **Other product identifiers:**
NONEL® MS
NONEL® EZ DET®
NONEL® MS ARCTIC
NONEL® EZTL™
NONEL® LP NONEL®
EZ DRIFTER®
NONEL® SL
NONEL® SUPER
NONEL® TD
NONEL® MS CONNECTOR
NONEL® TWINPLEX™
NONEL® STARTER
- **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.
Commercial blasting applications
- **1.3 Details of the supplier of the Safety Data Sheet**
- **Manufacturer/Supplier:**
Dyno Nobel Inc.
2795 East Cottonwood Parkway, Suite 500
Salt Lake City, Utah 84121
Phone: 801-364-4800
Fax: 801-321-6703
E-Mail: dnna.hse@am.dynonobel.com
- **1.4 Emergency telephone number:**
CHEMTREC
1-800-424-9300 (US/Canada)
+01 703-527-3887 (International)

SECTION 2: Hazards identification

- **2.1 Classification of the substance or mixture**
- **Classification according to Regulation (EC) No 1272/2008**
Classifications listed also are applicable to the OSHA GHS Hazard Communication Standard (29CFR1910.1200).



exploding bomb

Expl. 1.4 H204 Fire or projection hazard.

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- **Classification according to Directive 67/548/EEC or Directive 1999/45/EC**

R5: Heating may cause an explosion.

- **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.

- **Additional information:**

There are no other hazards not otherwise classified that have been identified.

0 percent of the mixture consists of component(s) of unknown toxicity

- **2.2 Label elements**

- **Labelling according to Regulation (EC) No 1272/2008**

The product is additionally classified and labelled according to the Globally Harmonized System within the United States (GHS).

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

- **Hazard pictograms**



GHS01

- **Signal word** Warning

- **Hazard-determining components of labelling:**

diazodinitro phenol (DDNP)

pentaerythritol tetranitrate (PETN)

octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)

lead diazide

orange lead

- **Hazard statements**

H204 Fire or projection hazard.

- **Precautionary statements**

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

P250 Do not subject to grinding/shock/friction.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P240 Ground/bond container and receiving equipment.

P373 DO NOT fight fire when fire reaches explosives.

P370+P380 In case of fire: Evacuate area.

P372 Explosion risk in case of fire.

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

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

- **Additional information:**

EUH201 Contains lead. Should not be used on surfaces liable to be chewed or sucked by children.

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- **Hazard description:**
- **WHMIS-symbols:** Explosive products are not classified under WHMIS.
- **NFPA ratings (scale 0 - 4)** Not available.
- **HMIS-ratings (scale 0 - 4)** Not available

· **HMIS Long Term Health Hazard Substances**

13424-46-9	lead diazide
7439-92-1	lead
13463-67-7	titanium dioxide
7758-97-6	lead chromate
7778-74-7	potassium perchlorate

- **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.

SECTION 3: Composition/information on ingredients

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

· **Dangerous components:**

CAS: 78-11-5	pentaerythritol tetranitrate (PETN)
EINECS: 201-084-3	 E R3
Index number: 603-035-00-5	 Unst. Expl., H200

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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 ☠ Carc. 1B, H350; Repr. 1A, H360Df; STOT RE 2, H373 ⚠ Aquatic Acute 1, H400; Aquatic Chronic 1, H410 ⚠ Acute Tox. 4, H302; Acute Tox. 4, H332
CAS: 7439-92-1 EINECS: 231-100-4	lead ☠ T Repr. Cat. 1 R60-61-48/23/25; ☠ N R50/53 ☠ Repr. 1A, H360FD; STOT RE 1, H372 ⚠ Aquatic Acute 1, H400; Aquatic Chronic 1, H410
CAS: 7440-21-3 EINECS: 231-130-8	silicon ☠ F R11 ⚠ Flam. Sol. 2, H228
CAS: 2691-41-0 EINECS: 220-260-0	octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX) ☠ T R24; ☠ Xn R22; ☠ E R2 ⚠ Expl. 1.1, H201 ⚠ Acute Tox. 3, H301; Acute Tox. 3, H311
CAS: 7782-49-2 EINECS: 231-957-4 Index number: 034-001-00-2	selenium ☠ T R23/25 R33-53 ⚠ Acute Tox. 3, H301; Acute Tox. 3, H331 ☠ STOT RE 2, H373 Aquatic Chronic 4, H413
CAS: 1314-41-6 EINECS: 215-235-6 Index number: 082-001-00-6	orange lead ☠ T Repr. Cat. 1, 3 R61; ☠ Xn R62-20/22; ☠ N R50/53 R33 ☠ Carc. 1B, H350; Repr. 1A, H360Df; STOT RE 2, H373 ⚠ Aquatic Acute 1, H400; Aquatic Chronic 1, H410 ⚠ Acute Tox. 4, H302; Acute Tox. 4, H332
CAS: 10294-40-3 EINECS: 233-660-5 Index number: 056-002-00-7	barium chromate ☠ Xn R20/22 ☠ Carc. 1A, H350 ⚠ Acute Tox. 4, H302; Acute Tox. 4, H332
CAS: 7758-97-6 EINECS: 231-846-0 Index number: 082-004-00-2	lead chromate ☠ T Carc. Cat. 2, Repr. Cat. 1, 3 R45-61; ☠ Xn R62; ☠ N R50/53 R33 ☠ Carc. 1B, H350; Repr. 1A, H360Df; STOT RE 2, H373 ⚠ Aquatic Acute 1, H400; Aquatic Chronic 1, H410
CAS: 4682-03-5	diazodinitro phenol (DDNP) ☠ Xi R36/38; ☠ Xi R43; ☠ E R3 ⚠ Unst. Expl., H200 ⚠ Skin Irrit. 2, H315; Eye Irrit. 2, H319; Skin Sens. 1, H317
CAS: 7440-36-0 EINECS: 231-146-5	antimony substance with a Community workplace exposure limit

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CAS: 7440-33-7 EINECS: 231-143-9	tungsten substance with a Community workplace exposure limit
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
CAS: 7439-98-7 EINECS: 231-107-2	molybdenum substance with a Community workplace exposure limit
CAS: 61790-53-2	Diatomaceous earth (Silica-Amorphous) substance with a Community workplace exposure limit
CAS: 7778-74-7 EINECS: 231-912-9 Index number: 017-008-00-5	potassium perchlorate Xn R22; O R9 Ox. Sol. 1, H271 Acute Tox. 4, H302
CAS: 7727-43-7 EINECS: 231-784-4	barium sulphate, natural substance with a Community workplace exposure limit
SVHC	
13424-46-9	lead diazide
1314-41-6	orange lead
7758-97-6	lead chromate

Additional information:

For the wording of the listed risk phrases refer to section 16.

For the listed ingredients, the identity and exact percentages are being withheld as a trade secret.

SECTION 4: First aid measures

4.1 Description of first aid measures

General information: No special measures required.

After inhalation:

Unlikely route of exposure.

Supply fresh air; consult doctor in case of complaints.

After skin contact:

Generally the product does not irritate the skin.

Wash with soap and water.

If skin irritation is experienced, 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:

Unlikely route of exposure.

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.

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· **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.

SECTION 5: Firefighting measures

· **5.1 Extinguishing media**

· **Suitable extinguishing agents:** DO NOT fight fire when fire reaches explosives.

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

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

DO NOT ATTEMPT TO FIGHT FIRES INVOLVING EXPLOSIVE MATERIALS. Evacuate all personnel to a predetermined safe location, no less than 2,500 feet in all directions. Can explode or detonate under fire conditions. Burning material may produce toxic vapors. It is recommended that users of explosives material be familiar with the Institute of Makers of Explosives Safety Library publications.

Fire or projection hazard.

Product may explode if burned in confined space. Individual cartridges may explode. Mass explosion of many cartridges at once is unlikely.

· **5.3 Advice for firefighters**

· **Protective equipment:**

Wear self-contained respiratory protective device.

Wear fully protective suit.

· **Additional information**

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. Will not mass explode if multiple devices are involved. Burning material may produce toxic and irritating vapors. In unusual cases, shrapnel may be thrown from exploding devices under containment. See 2008 Emergency response Guidebook for further information.

SECTION 6: Accidental release measures

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

Wear protective clothing.

Ensure adequate ventilation

Protect from heat.

· **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 unusable material as waste according to item 13.

· **6.4 Reference to other sections**

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.

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See Section 13 for disposal information.

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SECTION 7: Handling and storage

- **7.1 Precautions for safe handling**

Handle with care. Avoid jolting, friction and impact.

Use only in well ventilated areas.

Do not subject to grinding/shock/friction.

- **Information about fire - and explosion protection:**

Protect from heat.

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:**

Store in a cool location.

Avoid storage near extreme heat, ignition sources or open flame.

- **Information about storage in one common storage facility:** Store away from foodstuffs.

- **Further information about storage conditions:**

Store in cool, dry conditions in well sealed receptacles.

Keep away from heat.

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

SECTION 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:**

13424-46-9 lead diazide

PEL (USA) Long-term value: 0,05 mg/m³
as Pb; See 29 CFR 1910,1025

REL (USA) Long-term value: 0,05* mg/m³
as Pb;*8-hr TWA; See Pocket Guide App. C

TLV (USA) Long-term value: 0,05 mg/m³
as Pb; BEI

EL (Canada) Long-term value: 0,05 mg/m³
as Pb; IARC 2A, R

7439-92-1 lead

PEL (USA) Long-term value: 0,05* mg/m³
*see 29 CFR 1910,1025

REL (USA) Long-term value: 0,05* mg/m³
*8-hr TWA,excl. lead arsenate;See PocketGuideApp.C

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TLV (USA) Long-term value: 0,05* mg/m³
 *and inorganic compounds, as Pb; BEI

EL (Canada) Long-term value: 0,05 mg/m³
 R; IARC 2B

EV (Canada) Long-term value: 0,05 mg/m³
 as Pb, Skin (organic compounds)

7440-21-3 silicon

PEL (USA) Long-term value: 15* 5** mg/m³
 *total dust **respirable fraction

REL (USA) Long-term value: 10* 5** mg/m³
 *total dust **respirable fraction

TLV (USA) TLV withdrawn

EL (Canada) Long-term value: 10* 3** mg/m³
 *total dust; **respirable fraction

EV (Canada) Long-term value: 10 mg/m³
 total dust

7782-49-2 selenium

PEL (USA) Long-term value: 0,2 mg/m³
 as Se

REL (USA) Long-term value: 0,2 mg/m³
 as Se

TLV (USA) Long-term value: 0,2 mg/m³
 as Se

EL (Canada) Long-term value: 0,1 mg/m³

EV (Canada) Long-term value: 0,2 mg/m³

1314-41-6 orange lead

PEL (USA) Long-term value: 0,05 mg/m³
 as Pb; See 29 CFR 1910,1025

REL (USA) Long-term value: 0,05* mg/m³
 as Pb; *8-hr TWA; See Pocket Guide App. C

TLV (USA) Long-term value: 0,05 mg/m³
 as Pb; BEI

EL (Canada) Long-term value: 0,05 mg/m³
 as Pb; IARC 2A, R

EV (Canada) Long-term value: 0,05 mg/m³
 as Pb, Skin (organic compounds)

13463-67-7 titanium dioxide

PEL (USA) Long-term value: 15* mg/m³
 *total dust

REL (USA) See Pocket Guide App. A

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- TLV (USA) Long-term value: 10 mg/m³
withdrawn from NIC
- EL (Canada) Long-term value: 10* 3** mg/m³
*total dust; **respirable fraction; IARC 2B
- EV (Canada) Long-term value: 10 mg/m³
total dust

10294-40-3 barium chromate

- PEL (USA) Long-term value: 0,005* mg/m³
Ceiling limit: 0,1** mg/m³
*as Cr(VI) **as CrO₃; see 29 CFR 1910,1026
- REL (USA) Long-term value: 0,0002 mg/m³
as Cr; See Pocket Guide Apps. A and C
- TLV (USA) Long-term value: 0,01 mg/m³
as Cr
- EL (Canada) Long-term value: 0,01 mg/m³
as Cr; ACGIH A1 IARC 1

7758-97-6 lead chromate

- IOELV (EU) Long-term value: 2 mg/m³
as Cr
- PEL (USA) Long-term value: 0,005* mg/m³
Ceiling limit: 0,1** mg/m³
*as Cr(VI) **as CrO₃; see 29 CFR 1910,1026
- REL (USA) Long-term value: 0,0002 mg/m³
as Cr; See Pocket Guide Apps. A and C
- TLV (USA) Long-term value: 0,05* 0,012** mg/m³
*as Pb; BEI ; **as Cr
- EL (Canada) Long-term value: 0,05* 0,012** mg/m³
ACGIH A2, IARC 2A; R; *as Pb; **as Cr
- EV (Canada) Long-term value: 0,012* 0,05** mg/m³
*as Cr, **as Pb

7727-43-7 barium sulphate, natural

- PEL (USA) Long-term value: 15* 5** mg/m³
*total dust **respirable fraction
- REL (USA) Long-term value: 10* 5** mg/m³
*total dust **respirable fraction
- TLV (USA) Long-term value: 5* mg/m³
*inhalable fraction; E
- EL (Canada) Long-term value: 10* 3** mg/m³
*total dust, **respirable fraction
- EV (Canada) Long-term value: 10 mg/m³
total dust

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61790-53-2 Diatomaceous earth (Silica-Amorphous)

- PEL (USA) 20mppcf or 80mg/m³ /%SiO₂
 REL (USA) Long-term value: 6 mg/m³
 See Pocket Guide App. C
 TLV (USA) TLV withdrawn
 EL (Canada) Long-term value: 4* 1,5** mg/m³
 *total, **respirable
 EV (Canada) Long-term value: 10* 3** mg/m³
 uncalcined; *inhalable;**respirable

7439-98-7 molybdenum

- PEL (USA) Long-term value: 15* mg/m³
 *Total dust
 TLV (USA) Long-term value: 10* 3** mg/m³
 as Mo; *inhalable fraction ** respirable fraction
 EL (Canada) Long-term value: 3* 10** mg/m³
 as Mo; *respirable **inhalable
 EV (Canada) Long-term value: 10* 3** 0,5*** mg/m³
 metal,insol.compd.:*inh;**resp;sol.compd..***resp

7440-33-7 tungsten

- PEL (USA) and insoluble compounds, as We
 REL (USA) Short-term value: 10 mg/m³
 Long-term value: 5 mg/m³
 as W
 TLV (USA) Short-term value: 10 mg/m³
 Long-term value: 5 mg/m³
 as W
 EL (Canada) Short-term value: 10 mg/m³
 Long-term value: 5 mg/m³
 as W
 EV (Canada) Short-term value: 10* 3** mg/m³
 Long-term value: 5* 1** mg/m³
 (as tungsten; compds.:*water-insol.;**water-sol.

7429-90-5 aluminium powder (pyrophoric)

- PEL (USA) Long-term value: 15*; 15** mg/m³
 *Total dust; ** Respirable fraction
 REL (USA) Long-term value: 10* 5** mg/m³
 as Al*Total dust**Respirable/pyro powd./welding f.
 TLV (USA) Long-term value: 1* mg/m³
 as Al; *as respirable fraction
 EL (Canada) Long-term value: 1,0 mg/m³
 respirable, as Al

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EV (Canada)	Long-term value: 5 mg/m ³ aluminium-containing (as aluminium)
-------------	---

7440-36-0 antimony

PEL (USA)	Long-term value: 0,5 mg/m ³ as Sb
-----------	---

REL (USA)	Long-term value: 0,5 mg/m ³ as Sb
-----------	---

TLV (USA)	Long-term value: 0,5 mg/m ³ as Sb
-----------	---

EL (Canada)	Long-term value: 0,5 mg/m ³
-------------	--

EV (Canada)	Long-term value: 0,5 mg/m ³
-------------	--

- **DNELs** No further relevant information available.
- **PNECs** No further relevant information available.

· **Ingredients with biological limit values:**

13424-46-9 lead diazide

BEI (USA)	30 µg/100 ml Medium: blood Time: not critical Parameter: Lead
-----------	--

7439-92-1 lead

BEI (USA)	30 µg/100 ml Medium: blood Time: not critical Parameter: Lead
-----------	--

	10 µg/100 ml Medium: blood Time: not critical Parameter: Lead (women of child bearing potential)
--	---

1314-41-6 orange lead

BEI (USA)	30 µg/100 ml Medium: blood Time: not critical Parameter: Lead
-----------	--

10294-40-3 barium chromate

BEI (USA)	25 µg/L Medium: urine Time: end of shift at end of workweek Parameter: Total chromium (fume)
-----------	---

	10 µg/L Medium: urine Time: increase during shift Parameter: Total chromium (fume)
--	---

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7758-97-6 lead chromate

BEI (USA) 30 µg/100 ml
Medium: blood
Time: not critical
Parameter: Lead

10 µg/100 ml
Medium: blood
Time: not critical
Parameter: Lead (women of child bearing potential)

- **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 ignition sources away - Do not smoke.
Keep away from foodstuffs, beverages and feed.
Wash hands before breaks and at the end of work.
 - **Respiratory protection:**
Not required under normal conditions of use.
Respiratory protection may be required after product use.
 - **Protection of hands:**
Wear gloves for the protection against mechanical hazards according to NIOSH or EN 388.
 - **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:**
Face protection
-  Safety glasses
- **Body protection:** Impervious protective clothing
 - **Limitation and supervision of exposure into the environment**
No further relevant information available.
 - **Risk management measures**
Organizational measures should be in place for all activities involving this product.

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SECTION 9: Physical and chemical properties

- **9.1 Information on basic physical and chemical properties**
- **General Information**
- **Appearance:**
 - **Form:** Solid material
 - **Colour:** According to product specification
- **Odour:** Odourless
- **Odour threshold:** Not determined.
- **pH-value:** Not applicable.
- **Change in condition**
 - **Melting point/Melting range:** Not Determined.
 - **Boiling point/Boiling range:** Undetermined.
- **Flash point:** Not applicable.
- **Flammability (solid, gaseous):** Fire or projection hazard.
- **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:** Variable, dependent upon product composition and packaging.
- **Partition coefficient (n-octanol/water):** Not determined.
- **Viscosity:**
 - **Dynamic:** Not applicable.
 - **Kinematic:** Not applicable.
- **9.2 Other information** No further relevant information available.

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SECTION 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.
Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
- **10.3 Possibility of hazardous reactions**
Danger of explosion.
Toxic fumes may be released if heated above the decomposition point.
Reacts violently with oxidising agents.
- **10.4 Conditions to avoid** Keep ignition sources away - Do not smoke.
- **10.5 Incompatible materials:** No further relevant information available.
- **10.6 Hazardous decomposition products:**
Carbon monoxide and carbon dioxide
Hydrocarbons
Leadoxide vapour
Bariumoxide vapour
Toxic metal oxide smoke
Chlorine compounds
Danger of forming toxic pyrolysis products.
Nitrogen oxides

SECTION 11: Toxicological information

- **11.1 Information on toxicological effects**
- **Acute toxicity:**

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

7439-92-1 lead

Oral | LD50 | >2000 mg/kg (rat)

7782-49-2 selenium

Oral | LD50 | 6700 mg/kg (rat)

7758-97-6 lead chromate

Oral | LD50 | 12000 mg/kg (mouse)

- **Primary irritant effect:**
- **on the skin:**
Not a skin irritant in unused form. Vapors/particles from used product are possibly irritating to skin.
- **on the eye:**
Not an eye irritant in unused form. Vapors/particles from used product are possibly irritating to eyes.
- **Sensitisation:** No sensitising effects known.
- **Subacute to chronic toxicity:** No further relevant information available.
- **Acute effects (acute toxicity, irritation and corrosivity):** Danger of blast or crush-type injuries.
- **Repeated dose toxicity:**
Contains known or suspect carcinogens when inhaled. Product is in non-inhalable form and is nonclassifiable as a carcinogen.

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· **CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction):**

Contains known or suspect carcinogens when inhaled. Product is in non-inhalable form and is non-classifiable as a carcinogen.

SECTION 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:** Toxic for fish

· **Additional ecological information:**

· **General notes:**

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.

Also poisonous for fish and plankton in water bodies.

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

Toxic for aquatic organisms

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.

· **vPvB:** Not applicable.

· **12.6 Other adverse effects** No further relevant information available.

SECTION 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.

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.

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SECTION 14: Transport information

- 14.1 UN-Number UN0361
- DOT, ADR, IMDG, IATA
- 14.2 UN proper shipping name Detonator assemblies, non-electric
- DOT 0361 DETONATOR ASSEMBLIES, NONELECTRIC,
- ADR DETONATOR ASSEMBLIES, NONELECTRIC,
- IMDG DETONATOR ASSEMBLIES, NON-ELECTRIC
- IATA
- 14.3 Transport hazard class(es)
- DOT, ADR, IMDG, IATA



- Class 1.4
- Label 1.4B
- 14.4 Packing group
- DOT, ADR, IMDG, IATA II
- 14.5 Environmental hazards:
- Marine pollutant: No
- Special marking (IATA): Prohibited from Transport in Passenger Aircraft.



Cargo Aircraft Only.

- 14.6 Special precautions for user Not applicable.
- EMS Number: F-B,S-X
- Segregation groups Lead and its compounds
- 14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code Not applicable.
- Transport/Additional information:

- ADR
- Limited quantities (LQ) 0
- Excepted quantities (EQ) Code: EO
- Tunnel restriction code 2 (E)

- IMDG
- Limited quantities (LQ) 0
- Excepted quantities (EQ) Code: EO
- UN "Model Regulation": UN0361, DETONATOR ASSEMBLIES,
NONELECTRIC,, 1.4B, II

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SECTION 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 are listed.

- Section 313 (Specific toxic chemical listings):

13424-46-9 | lead diazide

7439-92-1 | lead

7782-49-2 | selenium

1314-41-6 | orange lead

10294-40-3 | barium chromate

7758-97-6 | lead chromate

7727-43-7 | barium sulphate, natural

7429-90-5 | aluminium powder (pyrophoric)

7440-36-0 | antimony

- TSCA (Toxic Substances Control Act):

All ingredients are listed.

- Proposition 65 (California):

- Chemicals known to cause cancer:

13424-46-9 | lead diazide

7439-92-1 | lead

1314-41-6 | orange lead

13463-67-7 | titanium dioxide

10294-40-3 | barium chromate

7758-97-6 | lead chromate

- Chemicals known to cause reproductive toxicity for females:

7439-92-1 | lead

10294-40-3 | barium chromate

7758-97-6 | lead chromate

- Chemicals known to cause reproductive toxicity for males:

7439-92-1 | lead

10294-40-3 | barium chromate

7758-97-6 | lead chromate

- Chemicals known to cause developmental toxicity:

13424-46-9 | lead diazide

7439-92-1 | lead

10294-40-3 | barium chromate

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7758-97-6 | lead chromate

· **Carcinogenic Categories**· **EPA (Environmental Protection Agency)**

13424-46-9	lead diazide	B2
7439-92-1	lead	B2
7782-49-2	selenium	D
1314-41-6	orange lead	B2
10294-40-3	barium chromate	A(inh), D(oral), K/L(inh), CBD(oral)
7758-97-6	lead chromate	K
7727-43-7	barium sulphate, natural	D, CBD(inh), NL(oral)
7778-74-7	potassium perchlorate	NL
2691-41-0	octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	D

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

13424-46-9	lead diazide	2A
7439-92-1	lead	2B
7782-49-2	selenium	3
1314-41-6	orange lead	2A
13463-67-7	titanium dioxide	2B
10294-40-3	barium chromate	1
7758-97-6	lead chromate	1
61790-53-2	Diatomaceous earth (Silica-Amorphous)	3

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

13424-46-9	lead diazide	A3
7439-92-1	lead	A3
1314-41-6	orange lead	A3
13463-67-7	titanium dioxide	A4
10294-40-3	barium chromate	A1
7758-97-6	lead chromate	A2
7439-98-7	molybdenum	A3
7429-90-5	aluminium powder (pyrophoric)	A4

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

13463-67-7	titanium dioxide
10294-40-3	barium chromate
7758-97-6	lead chromate

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

Some components are listed on the NDSL.

All ingredients are listed.

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

7439-92-1	lead
7782-49-2	selenium
10294-40-3	barium chromate
7758-97-6	lead chromate

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

7439-98-7	molybdenum
7440-33-7	tungsten
7429-90-5	aluminium powder (pyrophoric)
7440-36-0	antimony

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

This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the SDS 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
1314-41-6	orange lead
7758-97-6	lead chromate

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

SECTION 16: Other information

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· **Relevant phrases**

H200	Unstable explosives.
H201	Explosive; mass explosion hazard.
H228	Flammable solid.
H250	Catches fire spontaneously if exposed to air.
H261	In contact with water releases flammable gases.
H271	May cause fire or explosion; strong oxidiser.
H301	Toxic if swallowed.
H302	Harmful if swallowed.

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H311	Toxic in contact with skin.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H331	Toxic if inhaled.
H332	Harmful if inhaled.
H350	May cause cancer.
H360Df	May damage the unborn child. Suspected of damaging fertility.
H360FD	May damage fertility. May damage the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure.
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.
H413	May cause long lasting harmful effects to aquatic life.
R11	Highly flammable.
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.
R23/25	Toxic by inhalation and if swallowed.
R24	Toxic in contact with skin.
R3	Extreme risk of explosion by shock, friction, fire or other sources of ignition.
R33	Danger of cumulative effects.
R36/38	Irritating to eyes and skin.
R43	May cause sensitisation by skin contact.
R45	May cause cancer.
R48/23/25	Toxic: danger of serious damage to health by prolonged exposure through inhalation and if swallowed.
R50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R53	May cause long-term adverse effects in the aquatic environment.
R60	May impair fertility.
R61	May cause harm to the unborn child.
R62	Possible risk of impaired fertility.
R9	Explosive when mixed with combustible material.

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 Harmonised 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)
 DNEL: Derived No-Effect Level (REACH)

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PNEC: Predicted No-Effect Concentration (REACH)
 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
 Flam. Sol. 2: Flammable solids, Hazard Category 2
 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. 1: Oxidising Solids, Hazard Category 1
 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
 Skin Sens. 1: Sensitisation - Skin, Hazard Category 1
 Carc. 1A: Carcinogenicity, Hazard Category 1A
 Carc. 1B: Carcinogenicity, Hazard Category 1B
 Repr. 1A: Reproductive toxicity, Hazard Category 1A
 Repr. 1A: Reproductive toxicity, Hazard Category 1A
 STOT RE 1: Specific target organ toxicity - Repeated exposure, Hazard Category 1
 STOT RE 2: Specific target organ toxicity - Repeated exposure, Hazard Category 2
 Aquatic Acute 1: Hazardous to the aquatic environment - AcuteHazard, Category 1
 Aquatic Chronic 1: Hazardous to the aquatic environment - Chronic Hazard, Category 1
 Aquatic Chronic 4: Hazardous to the aquatic environment - Chronic Hazard, Category 4

Sources

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