Safety Data Sheet

According to: 1907/2006/EC (REACH), 1272/2008/EC (CLP), and OSHA GHS
Trade Name: Cast Boosters, Seismic

SECTION 1 – IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Name, Address, and Telephone of the Responsible Party

Dyno Nobel Inc.
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Salt Lake City, Utah 84121
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SDS #: 1145
Date: 07/20/2020
Supersedes: 05/22/2020

1.1 Product Identifier
Trade Name: Cast Boosters, Seismic
Article Number: 1145
Other Product Identifiers:
Geoprime®
Geoprime® dBX™
Geoseis® CTF

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. Emergency Telephone Number
CHEMTREC 1-800-424-9300 (US/Canada)
+01 703-527-3887 (International)

SECTION 2 – HAZARD(S) 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.

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: 0 percent of the mixture consists of component(s) of unknown toxicity
There are no other hazards not otherwise classified that have been identified.

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 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. P280 - Wear protective gloves/protective clothing/eye protection/face protection. 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.
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
None of the ingredients are listed.
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

3.1 Mixtures

Description: Mixture of substances listed below with nonhazardous additions.

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: 118-96-7 EINECS: 204-289-6 Index number: 609-008-00-4	2,4,6-trinitrotoluene (TNT) T R23/24/25; E R2; N R51/53 R33 Expl. 1.1, H201 Acute Tox. 3, H301; Acute Tox. 3, H311; Acute Tox. 3, H331 STOT RE 2, H373 Aquatic Chronic 2, H411
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

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.
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 – FIRE-FIGHTING 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: In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion. 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
Evacuate area.
Wear protective clothing.
Ensure adequate ventilation.
Keep away from ignition sources.
Protect from heat.
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: Keep ignition sources away - Do not smoke. 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. Store away from oxidising agents.
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.

8.1 Control Parameters

Ingredients with Limit Values that Require Monitoring at the Workplace	
118-96-7 2,4,6-trinitrotoluene (TNT)	
PEL (USA)	Long-term value: 1,5 mg/m³ Skin
REL (USA)	Long-term value: 0,5 mg/m³ Skin
TLV (USA)	Long-term value: 0,1 mg/m³ Skin; BEI-M
EL (Canada)	Long-term value: 0,1 mg/m³ Skin
EV (Canada)	Short-term value: 0,2 mg/m³, 0,02 ppm Long-term value: 0,1 mg/m³, 0,01 ppm Skin
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
EV (Canada)	Long-term value: 5 mg/m³ aluminium-containing (as aluminium)

DNELs: No further relevant information available.
PNECs: No further relevant information available.

Ingredients with biological limit values:	
118-96-7 2,4,6-trinitrotoluene (TNT)	
BEI (USA)	1,5 % of hemoglobin Medium: blood Time: during or end of shift Parameter: Methemoglobin (background, nonspecific, semi-quantitative)

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.
Wash hands before breaks and at the end of work.
Keep ignition sources away - Do not smoke.
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 cannot 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.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on Basic Physical and Chemical Properties

General Information		
Appearance		
Form	:	Solid material
Color	:	According to product specification
Odor	:	Odourless
Odor Threshold	:	Not determined.
pH- Value	:	Not applicable.
Change in Condition		
Melting point/Melting range	:	80 °C (176 °F) (trinitrotoluene)
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.
Explosion limits		
Lower	:	Not determined.
Upper	:	Not determined.
Vapour pressure	:	Not applicable.
Density at 20 °C (68 °F):	:	1,62 - 1,75 g/cm³ (13,519 - 14,604 lbs/gal)
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: 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.

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
Nitrogen oxides
Toxic metal oxide smoke

SECTION 11 – TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects:

Acute toxicity:

LD/LC50 values relevant for classification: None.

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: No further relevant information available.

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: No further relevant information available.

12.4 Mobility in Soil: No further relevant information available.
Ecotoxical 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.
Toxic for aquatic organisms.
Due to available data on eliminability/decomposition and bioaccumulation potential prolonged term damage of the environment cannot 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.

SECTION 14 – TRANSPORT INFORMATION

14.1 UN-Number
DOT, ADR, IMDG : UN0042
IATA : FORBIDDEN
14.2 UN Proper Shipping Name
DOT, IMDG : Boosters, without detonator
ADR : 0042, BOOSTERS, WITHOUT DETONATOR
IATA : FORBIDDEN
14.3 Transport Hazard Class(es)
DOT, ADR, IMDG

Class : 1.1
Label : 1.1D
IATA
Class : FORBIDDEN
14.4 Packing Group
DOT, ADR, IMDG : II
IATA : FORBIDDEN
14.5 Environmental Hazards
Marine Pollutant: : No

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" : UN0042, BOOSTERS, WITHOUT DETONATOR, 1.1D, 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)	
7429-90-5 aluminium powder (pyrophoric)	
TSCA (Toxic Substances Control Act)	
All ingredients are listed.	
Proposition 65 (California)	
Chemicals known to cause cancer	
118-96-7 2,4,6-trinitrotoluene (TNT)	
Chemicals known to cause reproductive toxicity for females	
None of the ingredients are listed.	
Chemicals known to cause reproductive toxicity for males	
None of the ingredients are listed.	
Chemicals known to cause developmental toxicity	
None of the ingredients are listed.	
Carcinogenic Categories	
EPA (Environmental Protection Agency)	
118-96-7 2,4,6-trinitrotoluene (TNT)	C
121-82-4 perhydro-1,3,5-trinitro-1,3,5-triazine (RDX)	C
2691-41-0 octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	D
IARC (International Agency for Research on Cancer)	
118-96-7 2,4,6-trinitrotoluene (TNT)	3
TLV (Threshold Limit Value established by ACGIH)	
7429-90-5 aluminium powder (pyrophoric)	A4
121-82-4 perhydro-1,3,5-trinitro-1,3,5-triazine (RDX)	A4
NIOSH-Ca (National Institute for Occupational Safety and Health)	

None of the ingredients are listed.
Canada **Canadian Domestic Substances List (DSL)**
All ingredients are listed.
Canadian Ingredient Disclosure list (limit 0.1%)
None of the ingredients are listed.
Canadian Ingredient Disclosure list (limit 1%)
118-96-7 2,4,6-trinitrotoluene (TNT)
7429-90-5 aluminium powder (pyrophoric)

Other regulations, limitations and prohibitive regulations
This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations.
Substances of very high concern (SVHC) according to REACH, Article 57
None of the ingredients are listed.

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

SECTION 16 – OTHER INFORMATION

Revision Date	:	07/20/2020
Other Information	:	This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

Relevant Phrases

- H200 Unstable explosives.
- H201 Explosive; mass explosion hazard.
- H250 Catches fire spontaneously if exposed to air.
- H261 In contact with water releases flammable gases.
- H301 Toxic if swallowed.
- H311 Toxic in contact with skin.
- H331 Toxic if inhaled.
- H373 May cause damage to organs through prolonged or repeated exposure.
- H411 Toxic to aquatic life with long lasting effects.
- 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.
- R23/24/25 Toxic by inhalation, in contact with skin and if swallowed.
- R3 Extreme risk of explosion by shock, friction, fire or other sources of ignition.
- R33 Danger of cumulative effects.
- R51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

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
- Pyr. Sol. 1: Pyorphoric Solids, Hazard Category 1
- Water-react. 2: Substances and Mixtures which, in contact with water, emit flammable gases, Hazard Category 2
- Acute Tox. 3: Acute toxicity, Hazard Category 3
- STOT RE 2: Specific target organ toxicity - Repeated exposure, Hazard Category 2
- Aquatic Chronic 2: Hazardous to the aquatic environment - Chronic Hazard, Category 2

Sources
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