SIGNAL CARTRIDGE, CAL. 4, SINGLE STAR RED

Drew Marine Signal and Safety Germany GmbH

Chemwatch: **66-6775**
Version No: **2.1.1.1**
Safety Data Sheet

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S.GHS.CAN.EN

SECTION 1 IDENTIFICATION

Product Identifier

Product name	SIGNAL CARTRIDGE, CAL. 4, SINGLE STAR RED
Synonyms	Art. 9182000
Proper shipping name	CARTRIDGES, SIGNAL
Other means of identification	Not Available

Recommended use of the chemical and restrictions on use

Relevant identified uses	Use according to manufacturer's directions. Sea distress signal. Coloured signal cartridge for use with calibre 4 (26.5 mm) Signal Pistol. Use the red colour to signal distress.

Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party

Registered company name	Drew Marine Signal and Safety Germany GmbH
Address	Vieländer Weg 147 Bremerhaven 27574 Germany
Telephone	+49 471 3930
Fax	+49 471 3932 10
Website	www.signalandsafety.com
Email	info@signalandsafety.com

Emergency phone number

Association / Organisation	Consultant Lutz Harder GmbH
Emergency telephone numbers	+49 178 433 7434
Other emergency telephone numbers	CHEMWATCH: From whithin the US and CANADA: 1 877 715 9305 OR call +613 9573 3112. From outside the US and Canada: +800 2436 2255 (+800 CHEMCALL) or +61 3 9573 3112

SECTION 2 HAZARD(S) IDENTIFICATION

Classification of the substance or mixture

CANADIAN WHMIS SYMBOLS

CANADIAN WHMIS CLASSIFICATION

Ingredient	CAS number	Classification Description	Classification Code
magnesium	7439-95-4	Flammable Solid, Reactive Flammable Material	B4, B6
potassium nitrate	7757-79-1	Oxidizing Material	C
sulfur	7704-34-9.	Flammable Solid	B4

Classification	Explosive Division 1.4, Eye Irritation Category 2B

Label elements

GHS label elements	
SIGNAL WORD	WARNING

Hazard statement(s)

Continued...

H204	Fire or projection hazard.
H320	Causes eye irritation.

Hazard(s) not otherwise specified

Not Applicable

Precautionary statement(s) Prevention

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

Precautionary statement(s) Response

P370+P372+P380+P373	In case of fire: Explosion risk. Evacuate area. DO NOT fight fire when fire reaches explosives.
P370+P380+P375	In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313	If eye irritation persists: Get medical advice/attention.

Precautionary statement(s) Storage

P401	Store in accordance with local regulations for explosives.

Precautionary statement(s) Disposal

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

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

Substances

See section below for composition of Mixtures

Mixtures

CAS No	%[weight]	Name
		hermetically sealed device contains;
		polytechnic materials of;
7439-95-4	30-60	magnesium
10042-76-9	30-60	strontium nitrate
7757-79-1	10-30	potassium nitrate
7704-34-9.	1-5	sulfur
7429-90-5	<1	aluminium

The specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.

SECTION 4 FIRST-AID MEASURES

Description of first aid measures

Eye Contact	If this product comes in contact with eyes: ▸ Wash out immediately with water. ▸ If irritation continues, seek medical attention. ▸ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
Skin Contact	If skin contact occurs: ▸ Immediately remove all contaminated clothing, including footwear. ▸ Flush skin and hair with running water (and soap if available). ▸ Seek medical attention in event of irritation.
Inhalation	▸ If fumes or combustion products are inhaled remove from contaminated area. ▸ Lay patient down. Keep warm and rested. ▸ Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures. ▸ Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary. ▸ Transport to hospital, or doctor, without delay.
Ingestion	Not considered a normal route of entry. ▸ If swallowed do **NOT** induce vomiting. ▸ If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration. ▸ Observe the patient carefully. ▸ Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious. ▸ Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink. ▸ Seek medical advice.

Indication of any immediate medical attention and special treatment needed

Continued...

Treat symptomatically.

SECTION 5 FIRE-FIGHTING MEASURES

Extinguishing media

DANGER: Deliver media remotely.
- For minor fires: Flooding quantities only.
- For large fires: **Do not** attempt to extinguish.

|Apply by mechanical means only.

Special hazards arising from the substrate or mixture

Fire Incompatibility	Avoid contact with other chemicals.

Special protective equipment and precautions for fire-fighters

Fire Fighting	**WARNING**: EXPLOSIVE MATERIALS / ARTICLES PRESENT! ▸ Evacuate all personnel and move upwind. ▸ Prevent re-entry. ▸ Alert Fire Brigade and tell them location and nature of hazard. ▸ May detonate and burning material may be propelled from fire. ▸ Wear full-body protective clothing with breathing apparatus. ▸ Prevent, by any means available, spillage and fire effluent from entering drains and water courses. ▸ Fight fire from safe distances and from protected locations. ▸ Use flooding quantities of water. ▸ **DO NOT** approach containers or packages suspected to be hot. ▸ Cool any exposed containers not involved in fire from a protected location. ▸ Equipment should be thoroughly decontaminated after use. Slight hazard when exposed to heat, flame and oxidisers.
Fire/Explosion Hazard	Division 1.4 Substances, mixtures and articles which present no significant hazard: substances, mixtures and articles which present only a small hazard in the event of ignition or initiation. The effects are largely confined to the package and no projection of fragments of appreciable size or range is to be expected. An external fire shall not cause virtually instantaneous explosion of almost the entire contents of the package. Compatibility Group G explosives are pyrotechnic substances, or article containing a pyrotechnic substances, or article containing both an explosive substance and an illuminating, incendiary, tear- or smoke-producing substance (other than a water-activated article or one containing white phosphorus, phosphides, a pyrophoric substance, a flammable liquid or gel, or hypergolic liquids). Combustible. Will burn if ignited. Combustion products include: , carbon monoxide (CO) , carbon dioxide (CO2) , other pyrolysis products typical of burning organic material.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

See section 8

Environmental precautions

See section 12

Methods and material for containment and cleaning up

Minor Spills	**WARNING!: EXPLOSIVE**. BLAST and/or PROJECTION and/or FIRE HAZARD ▸ Clean up all spills immediately. ▸ Avoid inhalation of the material and avoid contact with eyes and skin. ▸ Wear impervious gloves and safety glasses. ▸ Remove all ignition sources. ▸ Use spark-free tools when handling. ▸ Sweep into non-sparking containers or barrels and moisten with water. ▸ Place spilled material in clean, sealable, labelled container for disposal. ▸ Flush area with large amounts of water.
Major Spills	**WARNING!**: EXPLOSIVE. ▸ Clear area of personnel and move upwind. ▸ Alert Fire Brigade and tell them location and nature of hazard. ▸ May be violently or explosively reactive. ▸ Wear full body protective clothing with breathing apparatus. ▸ Consider evacuation (or protect in place). ▸ In case of transport accident notify Police, Emergency Authority, Competent Explosives Authority or Manufacturer. ▸ No smoking, naked lights, heat or ignition sources. ▸ Increase ventilation. ▸ Use extreme caution to prevent physical shock. ▸ Use only spark-free shovels and explosion-proof equipment. ▸ Collect recoverable material and segregate from spilled material. ▸ Wash spill area with large quantities of water.

Personal Protective Equipment advice is contained in Section 8 of the SDS.

SECTION 7 HANDLING AND STORAGE

Continued...

Precautions for safe handling

Safe handling	▸ Handle gently. Use good occupational work practice. ▸ Observe manufacturer's storage and handling recommendations contained within this SDS. ▸ Avoid all personal contact, including inhalation. ▸ Avoid smoking, naked lights, heat or ignition sources. ▸ Explosives must not be struck with metal implements. ▸ Avoid mechanical and thermal shock and friction. ▸ Use in a well ventilated area. ▸ Avoid contact with incompatible materials. ▸ When handling **DO NOT** eat, drink or smoke. ▸ Avoid physical damage to containers. ▸ Always wash hands with soap and water after handling. ▸ Work clothes should be laundered separately.
Other information	▸ Store cases in a well ventilated magazine licensed for the appropriate Class, Division and Compatibility Group. ▸ Rotate stock to prevent ageing. Use on FIFO (first in-first out) basis. ▸ Observe manufacturer's storage and handling recommendations contained within this SDS. ▸ Store in a cool place in original containers. ▸ Keep containers securely sealed. ▸ No smoking, naked lights, heat or ignition sources. ▸ Store in an isolated area away from other materials. ▸ Keep storage area free of debris, waste and combustibles. ▸ Protect containers against physical damage. ▸ Check regularly for spills and leaks **NOTE**: If explosives need to be destroyed contact the Competent Authority. ▸ Store away from incompatible materials. Keep out of reach of children.

Conditions for safe storage, including any incompatibilities

Suitable container	▸ All packaging for Class 1 Goods shall be in accordance with the requirements of the relevant Code for the transport of Dangerous Goods. ▸ Class 1 is unique in that the type of packaging used frequently has a very decisive effect on the hazard and therefore on the assignment to a particular division
Storage incompatibility	▸ Avoid contact with other explosives, pyrotechnics, solvents, adhesives, paints, cleaners and unauthorized metals, plastics, packing equipment and materials. ▸ Avoid contamination with acids, alkalis, reducing agents, amines and phosphorus. ▸ Explosion hazard may follow contact with incompatible materials

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

OCCUPATIONAL EXPOSURE LIMITS (OEL)

INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	magnesium	Particles (Insoluble or Poorly Soluble) Not Otherwise Specified: Inhalable fraction++ / Particles (Insoluble or Poorly Soluble) Not Otherwise Specified: Respirable fraction++	10 mg/m3 / 3 mg/m3	20 mg/m3 / 6 mg/m3	Not Available	Not Available
Canada - Northwest Territories Occupational Exposure Limits (English)	magnesium	Particles (Insoluble or Poorly Soluble) Not Otherwise Specified: Inhalable fraction / Particles (Insoluble or Poorly Soluble) Not Otherwise Specified: Respirable fraction	10 mg/m3 / 3 mg/m3	20 mg/m3 / 6 mg/m3	Not Available	Not Available
Canada - Nova Scotia Occupational Exposure Limits	magnesium	Particles (Insoluble or Poorly Soluble) [NOS] Inhalable particles / Particles (Insoluble or Poorly Soluble) [NOS] Respirable particles	10 mg/m3 / 3 mg/m3	Not Available	Not Available	See Appendix B current TLV/BEI Book
Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)	magnesium	Particulates Not Otherwise Classified (PNOC)	10 mg/m3	Not Available	Not Available	Not Available
Canada - Alberta Occupational Exposure Limits	magnesium	Particulate Not Otherwise Regulated - Total / Particulate Not Otherwise Regulated - Respirable	10 mg/m3 / 3 mg/m3	Not Available	Not Available	Not Available
Canada - British Columbia Occupational Exposure Limits	magnesium	Particles (Insoluble or Poorly Soluble) Not Otherwise Classified (PNOC)	10 mg/m3	Not Available	Not Available	(N) - the 8-hour TWA listed in the Table is for the total dust. The substance also has an 8-hour TWA of 3 mg/m3 for the respirable fraction.
Canada - Ontario Occupational Exposure Limits	magnesium	Particles (Insoluble or Poorly Soluble) Not Otherwise Specified (PNOS)	10, 3 mg/m3	Not Available	Not Available	Not Available
Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	sulfur	Particles (Insoluble or Poorly Soluble) Not Otherwise Specified: Inhalable fraction++ / Particles (Insoluble or Poorly Soluble) Not Otherwise Specified: Respirable fraction++	10 mg/m3 / 3 mg/m3	20 mg/m3 / 6 mg/m3	Not Available	Not Available
Canada - Northwest Territories Occupational Exposure Limits (English)	sulfur	Particles (Insoluble or Poorly Soluble) Not Otherwise Specified: Inhalable fraction / Particles (Insoluble or Poorly Soluble) Not Otherwise Specified: Respirable fraction	10 mg/m3 / 3 mg/m3	20 mg/m3 / 6 mg/m3	Not Available	Not Available
Canada - Nova Scotia Occupational Exposure Limits	sulfur	Particles (Insoluble or Poorly Soluble) [NOS] Inhalable particles / Particles (Insoluble or Poorly Soluble) [NOS] Respirable particles	10 mg/m3 / 3 mg/m3	Not Available	Not Available	See Appendix B current TLV/BEI Book

Continued...

Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)	sulfur	Particulates Not Otherwise Classified (PNOC)	10 mg/m3	Not Available	Not Available	Not Available
Canada - Alberta Occupational Exposure Limits	sulfur	Sulphur	10 mg/m3	Not Available	Not Available	Not Available
Canada - British Columbia Occupational Exposure Limits	sulfur	Particles (Insoluble or Poorly Soluble) Not Otherwise Classified (PNOC)	10 mg/m3	Not Available	Not Available	(N) - the 8-hour TWA listed in the Table is for the total dust. The substance also has an 8-hour TWA of 3 mg/m3 for the respirable fraction.
Canada - Ontario Occupational Exposure Limits	sulfur	Particles (Insoluble or Poorly Soluble) Not Otherwise Specified (PNOS)	10, 3 mg/m3	Not Available	Not Available	Not Available
Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	aluminium	Aluminum and compounds (as Al): Pyro powders	5 mg/m3	10 mg/m3	Not Available	Not Available
Canada - Northwest Territories Occupational Exposure Limits (English)	aluminium	Aluminum and compounds (as Al): Pyro powders	5 mg/m3	10 mg/m3	Not Available	Not Available
Canada - Nova Scotia Occupational Exposure Limits	aluminium	Aluminum - Metal	1 mg/m3	Not Available	Not Available	TLV Basis: Pneumoconiosis; lower respiratory tract irritation; neurotoxicity
Canada - Prince Edward Island Occupational Exposure Limits	aluminium	Aluminum metal and insoluble compounds	1 mg/m3	Not Available	Not Available	TLV® Basis: Pneumoconiosis; LRT irr; neurotoxicity
Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)	aluminium	Aluminum (as Al) / Aluminum (as Al): Metal / Aluminum (as Al): Welding fumes	10 mg/m3 / 5 mg/m3	Not Available	Not Available	Not Available
Canada - Manitoba Occupational Exposure Limits	aluminium	Not Available	1 mg/m3	Not Available	Not Available	Not Available
Canada - Alberta Occupational Exposure Limits	aluminium	Aluminum - Metal Dust	10 mg/m3	Not Available	Not Available	Not Available
Canada - British Columbia Occupational Exposure Limits	aluminium	Aluminum metal and insoluble compounds, Respirable	1.0 mg/m3	Not Available	Not Available	Not Available

EMERGENCY LIMITS

Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3
magnesium	Magnesium	18 mg/m3	200 mg/m3	1,200 mg/m3
strontium nitrate	Strontium nitrate	5.7 mg/m3	62 mg/m3	370 mg/m3
potassium nitrate	Potassium nitrate	9 mg/m3	100 mg/m3	600 mg/m3
sulfur	Sulfur	30 mg/m3	330 mg/m3	2,000 mg/m3

Ingredient	Original IDLH	Revised IDLH
magnesium	Not Available	Not Available
strontium nitrate	Not Available	Not Available
potassium nitrate	Not Available	Not Available
sulfur	Not Available	Not Available
aluminium	Not Available	Not Available

Exposure controls

Appropriate engineering controls	Engineering controls for explosive articles are designed to reduce or eliminate fragmentation and/or blast effects either by suppression of the source of detonation or by protection at the exposed location, or both. Barricades, shields, contained detonation chambers, and “zero quantity-distance (Q-D)” magazines are examples of engineering controls. Engineering controls are designed and tested in a rigorous fashion. The construction of the engineering control must be carefully duplicated in field applications to assure it will function properly. It is thus imperative that engineering controls be built exactly in accordance with the design package, and that they be used only for the articles (e.g.munitions) for which they are authorised.
Personal protection	
Eye and face protection	▸ Safety glasses with side shields ▸ Chemical goggles
Skin protection	See Hand protection below
Hands/feet protection	▸ Wear chemical protective gloves, e.g. PVC. ▸ Wear safety footwear or safety gumboots, e.g. Rubber
Body protection	See Other protection below
Other protection	▸ Fire resistant/ heat resistant gloves where practical, otherwise ▸ Heavy-duty chemically resistant gloves capable of providing short-term protection against spontaneous ignition. ▸ Safety footwear Hard hat |Ear Protection.

Continued...

Thermal hazards	Not Available

Respiratory protection

Respiratory protection not normally required due to the physical form of the product.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Cartridge with red colour plastic outer casing pressed with black/grey polytechnical ingredients.

Physical state	Manufactured	**Relative density (Water = 1)**	Not Applicable
Odour	Not Available	**Partition coefficient n-octanol / water**	Not Available
Odour threshold	Not Available	**Auto-ignition temperature (°C)**	>160
pH (as supplied)	Not Applicable	**Decomposition temperature**	Not Available
Melting point / freezing point (°C)	Not Applicable	**Viscosity (cSt)**	Not Applicable
Initial boiling point and boiling range (°C)	Not Applicable	**Molecular weight (g/mol)**	Not Applicable
Flash point (°C)	Not Available	**Taste**	Not Available
Evaporation rate	Not Applicable	**Explosive properties**	Not Available
Flammability	Not Available	**Oxidising properties**	Not Available
Upper Explosive Limit (%)	Not Available	**Surface Tension (dyn/cm or mN/m)**	Not Applicable
Lower Explosive Limit (%)	Not Available	**Volatile Component (%vol)**	Not Applicable
Vapour pressure (kPa)	Not Applicable	**Gas group**	Not Available
Solubility in water (g/L)	Immiscible	**pH as a solution (1%)**	Not Applicable
Vapour density (Air = 1)	Not Applicable	**VOC g/L**	Not Available

SECTION 10 STABILITY AND REACTIVITY

Reactivity	See section 7
Chemical stability	▸ Presence of shock and friction ▸ Presence of heat source and ignition source ▸ Product is considered stable under normal handling conditions. ▸ Stable under normal storage conditions. ▸ Hazardous polymerization will not occur. Avoid contact with other chemicals.
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects

Inhaled	Not normally a hazard due to physical form of product. Inhalation of vapour is more likely at higher than normal temperatures. The vapour is discomforting
Ingestion	Not normally a hazard due to physical form of product.
Skin Contact	Not normally a hazard due to physical form of product. The vapour is discomforting
Eye	Not normally a hazard due to physical form of product. The vapour is discomforting
Chronic	▸ Generally not applicable. |Principal hazards are related to the explosive/ decomposition by products of the cartridge, if inadvertently discharged or launched without adequate control and safety measures in place. Normal exposure to the article by all route is considered to be practically non-harmful.Over exposure to fumes from firing is harmful.

SIGNAL CARTRIDGE, CAL. 4, SINGLE STAR RED	TOXICITY	IRRITATION
	Not Available	Not Available
magnesium	TOXICITY	IRRITATION
	Oral (rat) LD50: >2000 mg/kg[1]	Not Available

Continued...

strontium nitrate	**TOXICITY**	**IRRITATION**
	Oral (rat) LD50: 1892 mg/kg[2]	Not Available
potassium nitrate	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >5000 mg/kg[1]	Not Available
	Oral (rat) LD50: >2000 mg/kg[1]	
sulfur	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >2000 mg/kg[1]	Eye (human): 8 ppm irritant
	Inhalation (rat) LC50: >5.43 mg/L/4hr[1]	
	Oral (rat) LD50: >2000 mg/kg[1]	
aluminium	**TOXICITY**	**IRRITATION**
	Oral (rat) LD50: >2000 mg/kg[1]	Not Available

Legend:	*1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2.* Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances*

STRONTIUM NITRATE	Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production.
ALUMINIUM	No significant acute toxicological data identified in literature search.

Acute Toxicity	⊘	**Carcinogenicity**	⊘
Skin Irritation/Corrosion	⊘	**Reproductivity**	⊘
Serious Eye Damage/Irritation	✔	**STOT - Single Exposure**	⊘
Respiratory or Skin sensitisation	⊘	**STOT - Repeated Exposure**	⊘
Mutagenicity	⊘	**Aspiration Hazard**	⊘

Legend:
✘ – *Data available but does not fill the criteria for classification*
✔ – *Data available to make classification*
⊘ – *Data Not Available to make classification*

SECTION 12 ECOLOGICAL INFORMATION

Toxicity

Ingredient	Endpoint	Test Duration (hr)	Species	Value	Source
magnesium	LC50	96	Fish	541mg/L	2
magnesium	EC50	72	Algae or other aquatic plants	>20mg/L	2
magnesium	EC50	72	Algae or other aquatic plants	>20mg/L	2
magnesium	NOEC	72	Algae or other aquatic plants	>25.5mg/L	2
strontium nitrate	LC50	96	Fish	>40.3mg/L	2
strontium nitrate	EC50	72	Algae or other aquatic plants	>43.3mg/L	2
strontium nitrate	EC50	72	Algae or other aquatic plants	>43.3mg/L	2
strontium nitrate	NOEC	96	Fish	>=40.3mg/L	2
potassium nitrate	LC50	96	Fish	22.5mg/L	4
potassium nitrate	EC50	96	Algae or other aquatic plants	1181.887mg/L	3
potassium nitrate	EC50	384	Crustacea	49.116mg/L	3
sulfur	LC50	96	Fish	<14mg/L	4
sulfur	EC50	48	Crustacea	>5000mg/L	4
sulfur	EC50	96	Algae or other aquatic plants	623.589mg/L	3
sulfur	EC50	384	Crustacea	26.113mg/L	3
sulfur	NOEC	504	Crustacea	>0.0025mg/L	2
aluminium	LC50	96	Fish	0.078-0.108mg/L	2
aluminium	EC50	48	Crustacea	0.7364mg/L	2
aluminium	EC50	96	Algae or other aquatic plants	0.0054mg/L	2

Continued...

aluminium	BCF	360	Algae or other aquatic plants	9mg/L	4
aluminium	EC50	120	Fish	0.000051mg/L	5
aluminium	NOEC	72	Algae or other aquatic plants	>=0.004mg/L	2
Legend:	*Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 - Aquatic Toxicity Data (Estimated) 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data*				

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
potassium nitrate	LOW	LOW
sulfur	LOW	LOW

Bioaccumulative potential

Ingredient	Bioaccumulation
potassium nitrate	LOW (LogKOW = 0.209)
sulfur	LOW (LogKOW = 0.229)

Mobility in soil

Ingredient	Mobility
potassium nitrate	LOW (KOC = 14.3)
sulfur	LOW (KOC = 14.3)

SECTION 13 DISPOSAL CONSIDERATIONS

Waste treatment methods

Product / Packaging disposal	▸ Explosives must not be thrown away, buried, discarded or placed with garbage. ▸ Explosives which are surplus, deteriorated or considered unsafe for transport, storage or use shall be destroyed and the statutory authorities shall be notified. ▸ This material may be disposed of by burning or detonation but the operation may only be performed under the control of a person trained in the safe destruction of explosives. Refer to local Waste Disposal Authority and supplier for suitable disposal procedure.

SECTION 14 TRANSPORT INFORMATION

Labels Required

Marine Pollutant	NO

Land transport (TDG)

UN number	0312
UN proper shipping name	CARTRIDGES, SIGNAL
Transport hazard class(es)	Class: 1.4G Subrisk: Not Applicable
Packing group	Not Applicable
Environmental hazard	Not Applicable
Special precautions for user	Special provisions: Not Applicable Explosive Limit and Limited Quantity Index: 25 ERAP Index: Not Applicable

Air transport (ICAO-IATA / DGR)

UN number	0312
UN proper shipping name	Cartridges, signal
Transport hazard class(es)	ICAO/IATA Class: 1.4G ICAO / IATA Subrisk: Not Applicable ERG Code: 1L
Packing group	Not Applicable
Environmental hazard	Not Applicable

Continued...

Special precautions for user	Special provisions	Not Applicable
	Cargo Only Packing Instructions	135
	Cargo Only Maximum Qty / Pack	75 kg
	Passenger and Cargo Packing Instructions	Forbidden
	Passenger and Cargo Maximum Qty / Pack	Forbidden
	Passenger and Cargo Limited Quantity Packing Instructions	Forbidden
	Passenger and Cargo Limited Maximum Qty / Pack	Forbidden

Sea transport (IMDG-Code / GGVSee)

UN number	0312	
UN proper shipping name	CARTRIDGES, SIGNAL	
Transport hazard class(es)	IMDG Class	1.4G
	IMDG Subrisk	Not Applicable
Packing group	Not Applicable	
Environmental hazard	Not Applicable	
Special precautions for user	EMS Number	F-B, S-X
	Special provisions	Not Applicable
	Limited Quantities	0

Transport in bulk according to Annex II of MARPOL and the IBC code

Not Applicable

SECTION 15 REGULATORY INFORMATION

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

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

MAGNESIUM(7439-95-4) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Canada - Northwest Territories Occupational Exposure Limits (English)	Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits
Canada - Alberta Occupational Exposure Limits	Canada Categorization decisions for all DSL substances
Canada - British Columbia Occupational Exposure Limits	Canada Domestic Substances List (DSL)
Canada - Nova Scotia Occupational Exposure Limits	International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
Canada - Ontario Occupational Exposure Limits	

STRONTIUM NITRATE(10042-76-9) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Canada Categorization decisions for all DSL substances	Canada Domestic Substances List (DSL)

POTASSIUM NITRATE(7757-79-1) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Canada Categorization decisions for all DSL substances	Canada Domestic Substances List (DSL)

SULFUR(7704-34-9.) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Canada - Northwest Territories Occupational Exposure Limits (English)	Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits
Canada - Alberta Occupational Exposure Limits	Canada Categorization decisions for all DSL substances
Canada - British Columbia Occupational Exposure Limits	Canada Domestic Substances List (DSL)
Canada - Nova Scotia Occupational Exposure Limits	International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
Canada - Ontario Occupational Exposure Limits	

ALUMINIUM(7429-90-5) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Canada - Northwest Territories Occupational Exposure Limits (English)	Canada - Quebec Permissible Exposure Values for Airborne Contaminants (French)
Canada - Alberta Occupational Exposure Limits	Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits
Canada - British Columbia Occupational Exposure Limits	Canada Categorization decisions for all DSL substances
Canada - Nova Scotia Occupational Exposure Limits	Canada Domestic Substances List (DSL)
Canada - Prince Edward Island Occupational Exposure Limits	

National Inventory	Status
Australia - AICS	Y
Canada - DSL	Y
Canada - NDSL	N (strontium nitrate; sulfur; magnesium; aluminium; potassium nitrate)
China - IECSC	Y
Europe - EINEC / ELINCS / NLP	Y
Japan - ENCS	N (sulfur; magnesium; aluminium)
Korea - KECI	Y
New Zealand - NZIoC	Y
Philippines - PICCS	Y

Continued...

USA - TSCA	Y
Legend:	*Y = All ingredients are on the inventory* *N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing(see specific ingredients in brackets)*

SECTION 16 OTHER INFORMATION

Other information

Ingredients with multiple cas numbers

Name	CAS No
strontium nitrate	10042-76-9, 13470-05-8
aluminium	7429-90-5, 91728-14-2

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

end of SDS