RED HANDFLARE

WesCom Signal & Rescue Germany GmbH

Chemwatch Hazard Alert Code: **2**

Chemwatch: **63-8488**
Version No: **5.1**
Safety Data Sheet (Conforms to Annex II of REACH (1907/2006) - Regulation 2020/878)

Issue Date: **11/07/2023**
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S.REACH.GB-NIR.EN.E

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

1.1. Product Identifier

Product name	RED HANDFLARE
Chemical Name	Not Applicable
Synonyms	Comet Red Handflare, Art.-No. 916280 up to 9162898;; Pains Wessex Red Handflare MK8, Art.-No.: 9529000,9529003, 9529007, 9529050, 9529260, 9529280;; Aurora Red Handflare, Art.-No. 9528500;; Oroquieta Handflare, Red, Chimi2, Art.-No. 9162400
Proper shipping name	SIGNAL DEVICES, HAND
Chemical formula	Not Applicable
Other means of identification	Not Available

1.2. Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	Sea distress signal. For use day or night Red Handflare is a short range distress signal used to pinpoint position. May be carried on ships bridge and six are required to be fitted in ships lifeboats and lifer afts. The handflare is suitable for use on other commercial and recreational boats. Use according to manufacturer's directions.
Uses advised against	No specific uses advised against are identified.

1.3. Details of the manufacturer or supplier of the safety data sheet

Registered company name	**WesCom Signal & Rescue Germany GmbH**
Address	Vielander Weg 147 Bremerhaven 27574 Germany
Telephone	+49 471 39 30
Fax	Not Available
Website	http://wescom-group.com/
Email	info@wescom-group.com

1.4. Emergency telephone number

Association / Organisation	**CONSULTANK Lutz Harder GmbH**
Emergency telephone numbers	+49 178 433 7434
Other emergency telephone numbers	Not Available

SECTION 2 Hazards identification

2.1. Classification of the substance or mixture

Classification according to regulation (EC) No 1272/2008 [CLP] and amendments [1]	H204 - Explosives Division 1.4
Legend:	*1. Classified by Chemwatch; 2. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI*

2.2. Label elements

Hazard pictogram(s)	
Signal word	**Warning**

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Hazard statement(s)

H204	Fire or projection hazard.

Supplementary statement(s)

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 and hearing 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.

Precautionary statement(s) Storage

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

Precautionary statement(s) Disposal

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

2.3. Other hazards

May produce discomfort of the eyes and skin*.

magnesium	Listed in the Europe Regulation (EC) No 1907/2006 - Annex XVII (Restrictions may apply)
aluminium	Listed in the Europe Regulation (EC) No 1907/2006 - Annex XVII (Restrictions may apply)

SECTION 3 Composition / information on ingredients

3.1.Substances

See 'Composition on ingredients' in Section 3.2

3.2.Mixtures

1. CAS No 2.EC No 3.Index No 4.REACH No	%[weight]	Name	Classification according to regulation (EC) No 1272/2008 [CLP] and amendments	SCL / M-Factor	Nanoform Particle Characteristics
Not Available		device contains	Not Applicable	Not Applicable	Not Available
Not Available		lighter composition, delay composition and ignition composition	Not Applicable	Not Applicable	Not Available
Not Available		polytechnic materials of;	Not Applicable	Not Applicable	Not Available
1. 7757-79-1 2.231-818-8 3.Not Available 4.Not Available	>60	potassium nitrate	Oxidizing Solids Category 3, Acute Toxicity (Oral) Category 4, Serious Eye Damage/Eye Irritation Category 2; H272, H302, H319 [1]	Not Available	Not Available
1. 7439-95-4 2.231-104-6 3.012-001-00-3|012-002-00-9 4.Not Available	30-60	magnesium	Flammable Solids Category 1, Substances and Mixtures which in Contact with Water Emit Flammable Gases Category 2; H228, H261 [1]	Not Available	Not Available
1. 10042-76-9 2.233-131-9 3.Not Available 4.Not Available	30-60	strontium nitrate	Oxidizing Solids Category 3, Skin Corrosion/Irritation Category 2, Serious Eye Damage/Eye Irritation Category 2, Specific Target Organ Toxicity - Single Exposure (Respiratory Tract Irritation) Category 3; H272, H315, H319, H335 [1]	Not Available	Not Available
1. 9002-86-2 2.Not Available 3.Not Available 4.Not Available	10-30	polyvinyl chloride	Skin Corrosion/Irritation Category 2, Serious Eye Damage/Eye Irritation Category 2, Specific Target Organ Toxicity - Single Exposure (Respiratory Tract Irritation) Category 3; H315, H319, H335 [1]	Not Available	Not Available
1. 10022-31-8 2.233-020-5 3.056-002-00-7 4.Not Available	30-60	barium nitrate *	Acute Toxicity (Oral) Category 4, Acute Toxicity (Inhalation) Category 4; H302, H332 [2]	*	Not Available
1. 7429-90-5 2.231-072-3 3.013-001-00-6|013-002-00-1 4.Not Available	5-10	aluminium	Pyrophoric Solids Category 1, Substances and Mixtures which in Contact with Water Emit Flammable Gases Category 2; H250, H261 [2]	Not Available	Not Available

Legend: *1. Classified by Chemwatch; 2. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI; 3. Classification drawn from C&L; * EU*

Continued...

	IOELVs available; [e] Substance identified as having endocrine disrupting properties

SECTION 4 First aid measures

4.1. 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.

4.2 Most important symptoms and effects, both acute and delayed

See Section 11

4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

SECTION 5 Firefighting measures

5.1. Extinguishing media

Apply by mechanical means only. Fight all fires from a remote and explosion resistant site.
DANGER: Deliver media remotely.
▸ For minor fires: Flooding quantities only.
▸ For large fires: **Do not** attempt to extinguish.

5.2. Special hazards arising from the substrate or mixture

Fire Incompatibility	Avoid contact with other chemicals.

5.3. Advice for firefighters

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

6.1. Personal precautions, protective equipment and emergency procedures

See section 8

6.2. Environmental precautions

See section 12

Continued...

6.3. 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.

6.4. Reference to other sections

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

SECTION 7 Handling and storage

7.1. 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.
Fire and explosion protection	See section 5
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.

7.2. 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
Hazard categories in accordance with Regulation (EC) No 1272/2008	P1b: Explosives
Qualifying quantity (tonnes) of dangerous substances as referred to in Article 3(10) for the application of	P1b Lower- / Upper-tier requirements: 50 / 200

7.3. Specific end use(s)

See section 1.2

SECTION 8 Exposure controls / personal protection

Continued...

8.1. Control parameters

Ingredient	DNELs Exposure Pattern Worker	PNECs Compartment
potassium nitrate	Not Available	18 mg/L (STP)
magnesium	Dermal 5 mg/kg bw/day (Systemic, Chronic) Inhalation 10 mg/m³ (Systemic, Chronic) Dermal 2.5 mg/cm² (Local, Chronic) Inhalation 10 mg/m³ (Local, Chronic) Dermal 80 mg/kg bw/day (Systemic, Acute) Inhalation 10 mg/m³ (Systemic, Acute) Dermal 2.5 mg/cm² (Local, Acute) Inhalation 10 mg/m³ (Local, Acute) *Dermal 2.5 mg/kg bw/day (Systemic, Chronic) ** *Inhalation 5 mg/m³ (Systemic, Chronic) ** *Oral 3.6 mg/kg bw/day (Systemic, Chronic) ** *Dermal 1.25 mg/cm² (Local, Chronic) ** *Inhalation 5 mg/m³ (Local, Chronic) ** *Dermal 40 mg/kg bw/day (Systemic, Acute) ** *Inhalation 5 mg/m³ (Systemic, Acute) ** *Oral 100 mg/kg bw/day (Systemic, Acute) ** *Dermal 1.25 mg/cm² (Local, Acute) ** *Inhalation 5 mg/m³ (Local, Acute) **	0.41 mg/L (Water (Fresh)) 0.41 mg/L (Water - Intermittent release) 1.4 mg/L (Water (Marine)) 87.8 mg/kg sediment dw (Sediment (Fresh Water)) 8.78 mg/kg sediment dw (Sediment (Marine)) 28.7 mg/kg soil dw (Soil) 10.8 mg/L (STP) 212 mg/kg food (Oral)
strontium nitrate	Dermal 40.1 mg/kg bw/day (Systemic, Chronic) Inhalation 7.9 mg/m³ (Systemic, Chronic) *Inhalation 2.4 mg/m³ (Systemic, Chronic) ** *Oral 1.2 mg/kg bw/day (Systemic, Chronic) **	2.1 mg/L (Water (Fresh)) 1811 mg/kg sediment dw (Sediment (Fresh Water)) 332 mg/kg soil dw (Soil) 4.2 mg/L (STP)
barium nitrate	Dermal 8.14 mg/kg bw/day (Systemic, Chronic) Inhalation 2.73 mg/m³ (Systemic, Chronic) *Dermal 4.07 mg/kg bw/day (Systemic, Chronic) ** *Inhalation 0.67 mg/m³ (Systemic, Chronic) ** *Oral 0.58 mg/kg bw/day (Systemic, Chronic) **	0.115 mg/L (Water (Fresh)) 11.5 µg/L (Water - Intermittent release) 600 mg/kg sediment dw (Sediment (Fresh Water)) 207.7 mg/kg soil dw (Soil) 62.2 mg/L (STP)
aluminium	Inhalation 3.72 mg/m³ (Systemic, Chronic) Inhalation 3.72 mg/m³ (Local, Chronic) *Oral 3.95 mg/kg bw/day (Systemic, Chronic) **	74.9 µg/L (Water (Fresh)) 20 mg/L (STP)

* Values for General Population

Occupational Exposure Limits (OEL)

INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
UK Workplace Exposure Limits (WELs)	polyvinyl chloride	Polyvinyl chlorid: inhalable dust	10 mg/m3	Not Available	Not Available	Not Available
UK Workplace Exposure Limits (WELs)	polyvinyl chloride	Polyvinyl chlorid: respirable dust	4 mg/m3	Not Available	Not Available	Not Available
EU Consolidated List of Indicative Occupational Exposure Limit Values (IOELVs)	barium nitrate	Barium (soluble compounds as Ba)	0.5 mg/m3	Not Available	Not Available	Not Available
UK Workplace Exposure Limits (WELs)	barium nitrate	Barium compounds, soluble (as Ba)	0.5 mg/m3	Not Available	Not Available	Not Available
UK Workplace Exposure Limits (WELs)	aluminium	Aluminium metal: inhalable dust	10 mg/m3	Not Available	Not Available	Not Available
UK Workplace Exposure Limits (WELs)	aluminium	Aluminium metal: respirable dust	4 mg/m3	Not Available	Not Available	Not Available

Emergency Limits

Ingredient	TEEL-1	TEEL-2	TEEL-3
potassium nitrate	9 mg/m3	100 mg/m3	600 mg/m3
magnesium	18 mg/m3	200 mg/m3	1,200 mg/m3
strontium nitrate	5.7 mg/m3	62 mg/m3	370 mg/m3
polyvinyl chloride	3 mg/m3	33 mg/m3	200 mg/m3
barium nitrate	2.9 mg/m3	350 mg/m3	2,100 mg/m3

Ingredient	Original IDLH	Revised IDLH
potassium nitrate	Not Available	Not Available
magnesium	Not Available	Not Available
strontium nitrate	Not Available	Not Available
polyvinyl chloride	Not Available	Not Available
barium nitrate	50 mg/m3	Not Available
aluminium	Not Available	Not Available

Occupational Exposure Banding

Ingredient	Occupational Exposure Band Rating	Occupational Exposure Band Limit
potassium nitrate	E	≤ 0.01 mg/m³

Continued...

Ingredient	Occupational Exposure Band Rating	Occupational Exposure Band Limit
strontium nitrate	E	≤ 0.01 mg/m³
Notes:	*Occupational exposure banding is a process of assigning chemicals into specific categories or bands based on a chemical's potency and the adverse health outcomes associated with exposure. The output of this process is an occupational exposure band (OEB), which corresponds to a range of exposure concentrations that are expected to protect worker health.*	

8.2. Exposure controls

8.2.1. 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.
8.2.2. Individual protection measures, such as personal protective equipment	
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	Ear 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

Respiratory protection

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

8.2.3. Environmental exposure controls

See section 12

SECTION 9 Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	Steel tube with orange/yellow/green outer casing pressed with black/grey polytechnical ingredients, contains ignitor and a grip.

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)**	Not Applicable
pH (as supplied)	Not Applicable	**Decomposition temperature (°C)**	>71
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)	160	**Taste**	Not Available
Evaporation rate	Not Applicable	**Explosive properties**	Not Available
Flammability	Not Applicable	**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	Immiscible	**pH as a solution (1%)**	Not Applicable
Vapour density (Air = 1)	Not Applicable	**VOC g/L**	Not Available
Nanoform Solubility	Not Available	**Nanoform Particle Characteristics**	Not Available
Particle Size	Not Available		

9.2. Other information

Not Available

SECTION 10 Stability and reactivity

Continued...

10.1.Reactivity	See section 7.2
10.2. 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.
10.3. Possibility of hazardous reactions	See section 7.2
10.4. Conditions to avoid	See section 7.2
10.5. Incompatible materials	See section 7.2
10.6. Hazardous decomposition products	See section 5.3

SECTION 11 Toxicological information

11.1. 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	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. ▸ Generally not applicable.

RED HANDFLARE	**TOXICITY**	**IRRITATION**
	Not Available	Not Available
potassium nitrate	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >5000 mg/kg[1]	Not Available
	Inhalation(Rat) LC50: >0.527 mg/l4h[1]	
	Oral (Rabbit) LD50; 1901 mg/kg[2]	
magnesium	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >2000 mg/kg[1]	Not Available
	Inhalation(Rat) LC50: >2.1 mg/l4h[1]	
	Oral (Rat) LD50: >2000 mg/kg[1]	
strontium nitrate	**TOXICITY**	**IRRITATION**
	Inhalation(Rat) LC50: >4.5 mg/l4h[1]	Eye: adverse effect observed (irritating)[1]
	Oral (Rat) LD50: >2000 mg/kg[1]	Skin: no adverse effect observed (not irritating)[1]
polyvinyl chloride	**TOXICITY**	**IRRITATION**
	Not Available	Not Available
barium nitrate	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >2000 mg/kg[1]	Eye (rabbit):100 mg/24h - moderate
	Oral (Rat) LD50: >50<300 mg/kg[1]	Skin (rabbit): 500 mg/24h - mild
aluminium	**TOXICITY**	**IRRITATION**
	Inhalation(Rat) LC50: >2.3 mg/l4h[1]	Eye: no adverse effect observed (not irritating)[1]
	Oral (Rat) LD50: >2000 mg/kg[1]	Skin: no adverse effect observed (not irritating)[1]
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*	

POLYVINYL CHLORIDE	The substance is classified by IARC as Group 3: **NOT** classifiable as to its carcinogenicity to humans. Evidence of carcinogenicity may be inadequate or limited in animal testing.
BARIUM NITRATE	The material may produce moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis. The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of

Continued...

	vesicles, scaling and thickening of the skin.
STRONTIUM NITRATE & POLYVINYL CHLORIDE	Asthma-like symptoms may continue for months or even years after exposure to the material ends. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur after exposure to high levels of highly irritating compound. Main criteria for diagnosing RADS include the absence of previous airways disease in a non-atopic individual, with sudden onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. Other criteria for diagnosis of RADS include a reversible airflow pattern on lung function tests, moderate to severe bronchial hyperreactivity on methacholine challenge testing, and the lack of minimal lymphocytic inflammation, without eosinophilia. 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. On the other hand, industrial bronchitis is a disorder that occurs as a result of exposure due to high concentrations of irritating substance (often particles) and is completely reversible after exposure ceases. The disorder is characterized by difficulty breathing, cough and mucus production.
POLYVINYL CHLORIDE & 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 either not available or does not fill the criteria for classification*
✔ *– Data available to make classification*

11.2 Information on other hazards

11.2.1. Endocrine disrupting properties

No evidence of endocrine disrupting properties were found in the current literature.

11.2.2. Other information

See Section 11.1

SECTION 12 Ecological information

12.1. Toxicity

RED HANDFLARE

Endpoint	Test Duration (hr)	Species	Value	Source
Not Available	Not Available	Not Available	Not Available	Not Available

potassium nitrate

Endpoint	Test Duration (hr)	Species	Value	Source
EC50	48h	Crustacea	490mg/l	2
NOEC(ECx)	144h	Fish	0.1mg/l	4
LC50	96h	Fish	>100mg/l	2

magnesium

Endpoint	Test Duration (hr)	Species	Value	Source
EC50	72h	Algae or other aquatic plants	>12mg/l	2
EC50	48h	Crustacea	344mg/l	2
EC50	96h	Algae or other aquatic plants	222.37mg/l	2
LC50	96h	Fish	541mg/l	2
NOEC(ECx)	72h	Algae or other aquatic plants	>=12mg/l	2

strontium nitrate

Endpoint	Test Duration (hr)	Species	Value	Source
EC50	72h	Algae or other aquatic plants	>43.3mg/l	2
EC50	48h	Crustacea	94mg/L	2
LC50	96h	Fish	>40.3mg/l	2
NOEC(ECx)	480h	Algae or other aquatic plants	15mg/L	2

polyvinyl chloride

Endpoint	Test Duration (hr)	Species	Value	Source
Not Available	Not Available	Not Available	Not Available	Not Available

barium nitrate

Endpoint	Test Duration (hr)	Species	Value	Source
EC50	72h	Algae or other aquatic plants	>1.15mg/l	2
EC50	48h	Crustacea	>=16<=18mg/l	2
LC50	96h	Fish	>3.5mg/l	2
NOEC(ECx)	72h	Algae or other aquatic plants	>=1.15mg/l	2

aluminium

Endpoint	Test Duration (hr)	Species	Value	Source
EC50	72h	Algae or other aquatic plants	0.017mg/L	2
EC50	48h	Crustacea	0.736mg/L	2

Continued...

	EC50	96h	Algae or other aquatic plants	0.005mg/L	2
	LC50	96h	Fish	0.078-0.108mg/l	2
	NOEC(ECx)	48h	Crustacea	>100mg/l	1

Legend:	*Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 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*

12.2. Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
potassium nitrate	LOW	LOW
polyvinyl chloride	LOW	LOW

12.3. Bioaccumulative potential

Ingredient	Bioaccumulation
potassium nitrate	LOW (LogKOW = 0.209)
polyvinyl chloride	LOW (LogKOW = 1.6233)

12.4. Mobility in soil

Ingredient	Mobility
potassium nitrate	LOW (KOC = 14.3)
polyvinyl chloride	LOW (KOC = 23.74)

12.5. Results of PBT and vPvB assessment

	P	B	T
Relevant available data	Not Available	Not Available	Not Available
PBT	✗	✗	✗
vPvB	✗	✗	✗

PBT Criteria fulfilled?	No
vPvB	No

12.6. Endocrine disrupting properties

No evidence of endocrine disrupting properties were found in the current literature.

12.7. Other adverse effects

No evidence of ozone depleting properties were found in the current literature.

SECTION 13 Disposal considerations

13.1. 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.
Waste treatment options	Not Available
Sewage disposal options	Not Available

SECTION 14 Transport information

Labels Required

	
Marine Pollutant	NO

Land transport (ADR-RID)

14.1. **UN number or ID number**	0191
14.2. **UN proper shipping name**	SIGNAL DEVICES, HAND

Continued...

14.3. **Transport hazard class(es)**	Class: 1.4G Subsidiary risk: Not Applicable
14.4. **Packing group**	Not Applicable
14.5. **Environmental hazard**	Not Applicable
14.6. **Special precautions for user**	Hazard identification (Kemler): Not Applicable Classification code: 1.4G Hazard Label: 1.4 Special provisions: Not Applicable Limited quantity: 0 Tunnel Restriction Code: 2 (E)

Air transport (ICAO-IATA / DGR)

14.1. **UN number**	0191
14.2. **UN proper shipping name**	Signal devices, hand
14.3. **Transport hazard class(es)**	ICAO/IATA Class: 1.4G ICAO / IATA Subrisk: Not Applicable ERG Code: 1L
14.4. **Packing group**	Not Applicable
14.5. **Environmental hazard**	Not Applicable
14.6. **Special precautions for user**	Special provisions: A802 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)

14.1. **UN number**	0191
14.2. **UN proper shipping name**	SIGNAL DEVICES, HAND
14.3. **Transport hazard class(es)**	IMDG Class: 1.4G IMDG Subrisk: Not Applicable
14.4. **Packing group**	Not Applicable
14.5. **Environmental hazard**	Not Applicable
14.6. **Special precautions for user**	EMS Number: F-B, S-X Special provisions: Not Applicable Limited Quantities: 0

Inland waterways transport (ADN)

14.1. **UN number**	0191
14.2. **UN proper shipping name**	SIGNAL DEVICES, HAND
14.3. **Transport hazard class(es)**	1.4G | Not Applicable
14.4. **Packing group**	Not Applicable
14.5. **Environmental hazard**	Not Applicable
14.6. **Special precautions for user**	Classification code: 1.4G Special provisions: Not Applicable Limited quantity: 0 Equipment required: PP Fire cones number: 1

14.7. Maritime transport in bulk according to IMO instruments

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

Continued...

Not Applicable

14.7.2. Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code

Product name	Group
potassium nitrate	Not Available
magnesium	Not Available
strontium nitrate	Not Available
polyvinyl chloride	Not Available
barium nitrate	Not Available
aluminium	Not Available

14.7.3. Transport in bulk in accordance with the IGC Code

Product name	Ship Type
potassium nitrate	Not Available
magnesium	Not Available
strontium nitrate	Not Available
polyvinyl chloride	Not Available
barium nitrate	Not Available
aluminium	Not Available

SECTION 15 Regulatory information

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

potassium nitrate is found on the following regulatory lists

Europe EC Inventory
European Union - European Inventory of Existing Commercial Chemical Substances (EINECS)
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2A: Probably carcinogenic to humans

magnesium is found on the following regulatory lists

EU REACH Regulation (EC) No 1907/2006 - Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles
Europe EC Inventory
European Union - European Inventory of Existing Commercial Chemical Substances (EINECS)
European Union (EU) Regulation (EC) No 1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures - Annex VI
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

strontium nitrate is found on the following regulatory lists

Europe EC Inventory
European Union - European Inventory of Existing Commercial Chemical Substances (EINECS)
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2A: Probably carcinogenic to humans

polyvinyl chloride is found on the following regulatory lists

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Not Classified as Carcinogenic
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

barium nitrate is found on the following regulatory lists

EU Consolidated List of Indicative Occupational Exposure Limit Values (IOELVs)
Europe EC Inventory
European Union - European Inventory of Existing Commercial Chemical Substances (EINECS)
European Union (EU) Regulation (EC) No 1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures - Annex VI
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2A: Probably carcinogenic to humans

aluminium is found on the following regulatory lists

EU REACH Regulation (EC) No 1907/2006 - Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles
Europe EC Inventory
European Union - European Inventory of Existing Commercial Chemical Substances (EINECS)
European Union (EU) Regulation (EC) No 1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures - Annex VI
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

This safety data sheet is in compliance with the following EU legislation and its adaptations - as far as applicable - : Directives 98/24/EC, - 92/85/EEC, - 94/33/EC, - 2008/98/EC, - 2010/75/EU; Commission Regulation (EU) 2020/878; Regulation (EC) No 1272/2008 as updated through ATPs.

Information according to 2012/18/EU (Seveso III):

Seveso Category	P1b

15.2. Chemical safety assessment

No Chemical Safety Assessment has been carried out for this substance/mixture by the supplier.

ECHA SUMMARY

Continued...

Ingredient	CAS number	Index No	ECHA Dossier
potassium nitrate	7757-79-1	Not Available	Not Available

Harmonisation (C&L Inventory)	Hazard Class and Category Code(s)	Pictograms Signal Word Code(s)	Hazard Statement Code(s)
1	Ox. Sol. 2; Skin Irrit. 2; Eye Irrit. 2; STOT SE 3	GHS03; GHS07; Dgr	H272; H315; H319; H335
2	Skin Irrit. 2; Eye Irrit. 2; STOT SE 3; Ox. Sol. 1; Aquatic Chronic 3; Acute Tox. 4; Repr. 2; STOT SE 2; STOT RE 2	GHS03; Dgr; GHS08	H315; H319; H335; H271; H412; H302; H361; H371; H373

Harmonisation Code 1 = The most prevalent classification. Harmonisation Code 2 = The most severe classification.

Ingredient	CAS number	Index No	ECHA Dossier
magnesium	7439-95-4	012-001-00-3|012-002-00-9	Not Available

Harmonisation (C&L Inventory)	Hazard Class and Category Code(s)	Pictograms Signal Word Code(s)	Hazard Statement Code(s)
1	Pyr. Sol. 1; Water-react. 1	GHS02; Dgr	H250; H260
2	Pyr. Sol. 1; Water-react. 1; Flam. Sol. 1; Self-heat. 1; Skin Irrit. 2; Eye Irrit. 2; STOT SE 3; Aquatic Chronic 4	GHS02; Dgr; GHS07	H250; H260; H228; H251; H315; H319; H335; H413

Harmonisation Code 1 = The most prevalent classification. Harmonisation Code 2 = The most severe classification.

Ingredient	CAS number	Index No	ECHA Dossier
strontium nitrate	10042-76-9	Not Available	Not Available

Harmonisation (C&L Inventory)	Hazard Class and Category Code(s)	Pictograms Signal Word Code(s)	Hazard Statement Code(s)
2	Ox. Sol. 1; Eye Dam. 1; Acute Tox. 4; Skin Irrit. 2; STOT SE 3	GHS03; GHS05; Dgr; GHS02	H271; H318; H302; H315; H335
1	Ox. Sol. 1; Eye Dam. 1	GHS03; GHS05; Dgr	H271; H318

Harmonisation Code 1 = The most prevalent classification. Harmonisation Code 2 = The most severe classification.

Ingredient	CAS number	Index No	ECHA Dossier
polyvinyl chloride	9002-86-2	Not Available	Not Available

Harmonisation (C&L Inventory)	Hazard Class and Category Code(s)	Pictograms Signal Word Code(s)	Hazard Statement Code(s)
1	Not Classified	Not Available	Not Available
2	Skin Irrit. 2; Eye Irrit. 2; STOT SE 3; Lact.; Aquatic Acute 1; Aquatic Chronic 1	GHS07; Wng; GHS09	H315; H319; H335; H362; H400; H410

Harmonisation Code 1 = The most prevalent classification. Harmonisation Code 2 = The most severe classification.

Ingredient	CAS number	Index No	ECHA Dossier
barium nitrate	10022-31-8	056-002-00-7	Not Available

Harmonisation (C&L Inventory)	Hazard Class and Category Code(s)	Pictograms Signal Word Code(s)	Hazard Statement Code(s)
1	Ox. Sol. 2; Acute Tox. 4; Acute Tox. 4	GHS03; GHS07; Dgr	H272; H302; H332
2	Ox. Sol. 2; Acute Tox. 3; Eye Irrit. 2; Acute Tox. 4	GHS03; GHS06; Dgr	H272; H301; H319; H332; H312

Harmonisation Code 1 = The most prevalent classification. Harmonisation Code 2 = The most severe classification.

Ingredient	CAS number	Index No	ECHA Dossier
aluminium	7429-90-5	013-001-00-6|013-002-00-1	Not Available

Harmonisation (C&L Inventory)	Hazard Class and Category Code(s)	Pictograms Signal Word Code(s)	Hazard Statement Code(s)
1	Flam. Sol. 1; Water-react. 2	GHS02; Dgr	H228; H261
2	Flam. Sol. 1; Water-react. 2; Pyr. Sol. 1; STOT RE 1; Aquatic Chronic 4; Aquatic Acute 1; Skin Sens. 1	Dgr; GHS01; GHS08; GHS09; GHS05; GHS06	H228; H261; H250; H372; H413; H302; H311; H315; H331; H400; H317

Harmonisation Code 1 = The most prevalent classification. Harmonisation Code 2 = The most severe classification.

National Inventory Status

National Inventory	Status
Australia - AIIC / Australia Non-Industrial Use	Yes
Canada - DSL	Yes
Canada - NDSL	No (potassium nitrate; magnesium; strontium nitrate; polyvinyl chloride; barium nitrate; aluminium)
China - IECSC	Yes
Europe - EINEC / ELINCS / NLP	No (polyvinyl chloride)
Japan - ENCS	No (magnesium; aluminium)
Korea - KECI	Yes
New Zealand - NZIoC	Yes

Continued...

National Inventory	Status
Philippines - PICCS	Yes
USA - TSCA	Yes
Taiwan - TCSI	Yes
Mexico - INSQ	Yes
Vietnam - NCI	Yes
Russia - FBEPH	Yes
Legend:	*Yes = All CAS declared ingredients are on the inventory* *No = One or more of the CAS listed ingredients are not on the inventory. These ingredients may be exempt or will require registration.*

SECTION 16 Other information

Revision Date	11/07/2023
Initial Date	04/07/2016

Full text Risk and Hazard codes

H228	Flammable solid.
H250	Catches fire spontaneously if exposed to air.
H251	Self-heating: may catch fire.
H260	In contact with water releases flammable gases which may ignite spontaneously.
H261	In contact with water releases flammable gases.
H271	May cause fire or explosion; strong oxidiser.
H272	May intensify fire; oxidiser.
H301	Toxic if swallowed.
H302	Harmful if swallowed.
H311	Toxic in contact with skin.
H312	Harmful in contact with skin.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H331	Toxic if inhaled.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H361	Suspected of damaging fertility or the unborn child.
H362	May cause harm to breast-fed children.
H371	May cause damage to organs.
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.
H412	Harmful to aquatic life with long lasting effects.
H413	May cause long lasting harmful effects to aquatic life.

SDS Version Summary

Version	Date of Update	Sections Updated
4.1	01/11/2019	One-off system update. NOTE: This may or may not change the GHS classification
5.1	11/07/2023	Hazards identification - Classification, Identification of the substance / mixture and of the company / undertaking - Synonyms

Other information

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.

For detailed advice on Personal Protective Equipment, refer to the following EU CEN Standards:
EN 166 Personal eye-protection
EN 340 Protective clothing
EN 374 Protective gloves against chemicals and micro-organisms
EN 13832 Footwear protecting against chemicals
EN 133 Respiratory protective devices

Definitions and abbreviations

PC—TWA: Permissible Concentration-Time Weighted Average
PC—STEL: Permissible Concentration-Short Term Exposure Limit

Continued...

IARC: International Agency for Research on Cancer
ACGIH: American Conference of Governmental Industrial Hygienists
STEL: Short Term Exposure Limit
TEEL: Temporary Emergency Exposure Limit。
IDLH: Immediately Dangerous to Life or Health Concentrations
ES: Exposure Standard
OSF: Odour Safety Factor
NOAEL :No Observed Adverse Effect Level
LOAEL: Lowest Observed Adverse Effect Level
TLV: Threshold Limit Value
LOD: Limit Of Detection
OTV: Odour Threshold Value
BCF: BioConcentration Factors
BEI: Biological Exposure Index
AIIC: Australian Inventory of Industrial Chemicals
DSL: Domestic Substances List
NDSL: Non-Domestic Substances List
IECSC: Inventory of Existing Chemical Substance in China
EINECS: European INventory of Existing Commercial chemical Substances
ELINCS: European List of Notified Chemical Substances
NLP: No-Longer Polymers
ENCS: Existing and New Chemical Substances Inventory
KECI: Korea Existing Chemicals Inventory
NZIoC: New Zealand Inventory of Chemicals
PICCS: Philippine Inventory of Chemicals and Chemical Substances
TSCA: Toxic Substances Control Act
TCSI: Taiwan Chemical Substance Inventory
INSQ: Inventario Nacional de Sustancias Químicas
NCI: National Chemical Inventory
FBEPH: Russian Register of Potentially Hazardous Chemical and Biological Substances

Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 [CLP]

Classification according to regulation (EC) No 1272/2008 [CLP] and amendments	Classification Procedure
Explosives Division 1.4, H204	On basis of test data