SAFETY DATA SHEET

1. Product and Company Identification

Red Emergency Flare - No Perchlorate (NPC) Formulation

Identification:
The NPC flare will have the following symbol on it:

Identification:
Emergency signal

Manufacturers Information
Orion Safety Products
28320 St. Michaels Rd
Easton, MD 21601
800-637-7807
410-822-0318

2. Hazards Identification

GHS Classifications
Skin irritation Category 2 H315
Eye irritation Category 2A H319
STOT - Single Exposure Category 3 H335

GHS Label Elements
Pictograms

Signal Word
Warning

Precautionary Statements
P261 Avoid breathing dust/smoke.
P264 Wash hands thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P280 Wear protective eye protection.
P301 /315 IF SWALLOWED: Get immediate medical advice /attention.
P302/352 IF ON SKIN: Wash with plenty of soap and water.
P304 /340/342 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If experiencing respiratory symptoms: Call a POISON CENTER or doctor / physician.
P305/338/351 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P333/313 If skin irritation or rash occurs, get medical advice / attention.

3. Composition / Information on Ingredients

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS #</th>
<th>EINCS #</th>
<th>%age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strontium Nitrate</td>
<td>10042-76-9</td>
<td>233-131-9</td>
<td>&lt;75%</td>
</tr>
<tr>
<td>Sulfur</td>
<td>7704-34-9</td>
<td>231-722-6</td>
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<td>Potassium Nitrate</td>
<td>7757-79-1</td>
<td>231-818-8</td>
<td>&lt;25%</td>
</tr>
<tr>
<td>Paraffinic Oil</td>
<td>64742-54-7</td>
<td>232-384-2</td>
<td>&lt;10%</td>
</tr>
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<td>Potassium Chlorate</td>
<td>3811-04-9</td>
<td>231-100-4</td>
<td>&lt;5%</td>
</tr>
<tr>
<td>Waxy sawdust</td>
<td>mixture</td>
<td>none</td>
<td>&lt;5%</td>
</tr>
<tr>
<td>Polyvinyl Chloride</td>
<td>9002-86-2</td>
<td>200-831-0</td>
<td>&lt;5%</td>
</tr>
<tr>
<td>Shellac</td>
<td>mixture</td>
<td>none</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Charcoal</td>
<td>1333-86-4</td>
<td>231-153-3</td>
<td>&lt;1%</td>
</tr>
</tbody>
</table>

Note: Due to Confidential Business Information i.e. "Trade Secrets", the exact percentage of each ingredient has not been disclosed. CBI information will be shared with appropriate authorities if circumstances warrant.

4. First Aid Measures

Description of first aid measures

**Inhalation:**
If contents are inhaled, remove to fresh air. Watch for signs of allergic reaction. If other symptoms develop, get medical aid immediately.

**Skin:**
If contents are contacted, wash with area with soap and water for 15 minutes. Remove contaminated clothing and wash before reuse. Get medical aid immediately if burned or irritation occurs.

**Eyes:**
If contents get into eye, flush with plenty of water for at least 15 minutes, occasionally lifting the upper and lower lids. Remove contact lenses if easily possible. Do not use boracic acid to rinse with; sulfur is an acid irritant. Get medical aid immediately.

**Ingestion:**
Get medical aid immediately.

---

EMERGENCY CHEMTREC
1-800-424-9300
5. Firefighting Measures

Extinguishing Media
Water deluge

Unsuitable Extinguishing Media
Foam and dry chemical extinguishers and sulfocation are ineffective.

Protective Equipment and Precautions for Firefighters
Wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full face piece operated in the pressure demand or other positive pressure mode. Prevent further propagation of fire by spraying unburnt nearby product with water. Combat fire from a sheltered position.

Specific Hazards Arising from the Chemical
Use copious amounts of water to extinguish fire comprised of flares. Flares contain oxidizers and will continue to burn unless a significant amount of water is used. Do not breathe smoke.

Further information
No data available.

6. Accidental Release Measures

Personal Precautions / Protective Equipment / Emergency Procedures
Do not breathe contents and avoid contact with skin and eyes. Wear flame-retardant clothing with long sleeves, dust mask, rubber or nitrile gloves, safety goggles, safety shoes. Avoid friction on the released product. Keep away from ignition sources.

Environmental Precautions
Prevent dispersion of contents on soil and in water. Prevent contents from spreading or entering into drains, ditches, groundwater or rivers by using appropriate barriers.

Methods for Containment and Clean-up
Use caution when cleaning up spilled product contents. Remove heat, flames, sparks and other sources of ignition. Use non-sparking tools and equipment. Prevent buildup of electrostatic charges by grounding. Clean spills in a manner that does not disperse dust into the air. Do not absorb in sawdust or other combustible absorbents. Pick up spill for recovery or disposal and place in an approved container. Wash away remainder with plenty of water. Collect wash water for approved disposal.

7. Handling and Storage

Precautions for Safe Handling
Hold and point flare away from body when igniting. Exercise caution when using this product since molten flecks may be emitted. Produces hot flame. Burning flares can cause severe burns if in contact with body. Avoid contact with clothing and other combustible materials. Wear eye protection during use. Follow instructions on package. Use outdoors only! Do not ignite or burn product inside a vehicle or building. Avoid inhalation of smoke. Do not dismantle. Do not allow contents to touch eyes, skin or clothing. Do not ingest contents as they may be harmful if swallowed. Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Avoid contact with heat, sparks, and flame.

Conditions for Safe Storage, Including Any Incompatibilities
Store away from direct sunlight, heat and incompatible materials. See section 10. Store away from food and beverages. Store away from flammable materials, sources of heat, flame and sparks. Store at ambient temperature. Do not store partially burned flares in a vehicle, warehouse, or any other building. Plastic bags are provided for moisture protection. Keep partially used bags sealed at all times.

8. Exposure Controls / Personal Protection

Control parameters

<table>
<thead>
<tr>
<th>Exposure Limits</th>
<th>OSHA PEL</th>
<th>ACGIH TLV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strontium Nitrate</td>
<td>Not Established</td>
<td>Not Established</td>
</tr>
<tr>
<td>Sulfur</td>
<td>Not Established</td>
<td>Not Established</td>
</tr>
<tr>
<td>Potassium Nitrate</td>
<td>Not Established</td>
<td>Nuisance dust 15 mg/m³.</td>
</tr>
<tr>
<td>Paraflin Oil</td>
<td>Not Established</td>
<td>5 mg/m³</td>
</tr>
<tr>
<td>Potassium Chlorate</td>
<td>Not Established</td>
<td>No Airborne Exposure Limits established</td>
</tr>
<tr>
<td>Waxy sawdust</td>
<td>Not Established</td>
<td></td>
</tr>
<tr>
<td>Polyvinyl Chloride</td>
<td>Not Established</td>
<td>No known hazardous components above regulatory thresholds in this product.</td>
</tr>
<tr>
<td>Shellac</td>
<td>Not Established</td>
<td>Nuisance dust 15 mg/m³.</td>
</tr>
<tr>
<td>Charcoal</td>
<td>Not Established</td>
<td></td>
</tr>
</tbody>
</table>

Exposure controls

Engineering Controls
Use product outdoors only! When cleaning up contents, use local and/or general exhaust.

Personal Protective Equipment

Eye / Face Protection
Safety glasses or goggles

Skin Protection
None under normal conditions when using product unless prolonged handling is anticipated. Impervious protective clothing, including gloves, boots, and a lab coat, apron or coveralls, as appropriate, when cleaning up spilled product. Wash hands and face before eating, drinking or using tobacco products.

Respiratory Protection
None under normal conditions when using product. A particular respirator (NIOSH N95 or better filters) may be worn during the cleanup of spilled materials.

General Hygiene
Use product outdoors away from combustible products. For cleanup of spilled materials, emergency showers and eye wash stations should be available. Educate and train employees in the safe use and handling of hazardous materials.

no pc flare
9. Physical and Chemical Properties

Appearance (color, physical form, shape): Yellow to grey powder.

pH: Not available

Boiling Point / Range: Not applicable

Vapor Pressure: Not applicable

Odor: No data available

Flammability: No data available

Partition Coefficient: No data available

Auto Ignition Temperature: 360°F

Melting Point: Not available

Freezing Point: Not applicable

Specific Gravity: Not applicable

Odor Threshold: No data available

Flammability Limits: No data available

Viscosity: No data available

Solubility: Not available

Evaporation Rate: Not applicable

Vapor Density: Not applicable

Flash Point: Not available

Relative Density: No data available

Decomposition Temperature: No data available

10. Stability and Reactivity

Chemical Stability: Stable

Reactivity: No information available

Possibility of Hazardous Reactions: Hazardous polymerization will not occur

Conditions to Avoid: Combustible materials, heat, flames, sparks and other sources of ignition. Moisture.

Incompatible Materials: Strong acids, strong fuels, ammonia salts, and strong bases. Strong oxidizers; chlorite salt.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, sulfur oxides, and nitrogen oxides.

11. Toxicology Information

Ingredient acute toxicity information

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Oral LD50</th>
<th>skin LD50</th>
<th>LC50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strontium Nitrate</td>
<td>Rat: 2750 mg/kg</td>
<td>No information found</td>
<td>No information found</td>
</tr>
<tr>
<td>Sulfur</td>
<td>Rat &gt;2000 mg/kg</td>
<td>Rat &gt;2000 mg/kg</td>
<td>Rat: 79.23 mg/l, 4hr</td>
</tr>
<tr>
<td>Polassium Nitrate</td>
<td>Rat: 3750 mg/kg</td>
<td>No Information found</td>
<td>No Information found</td>
</tr>
<tr>
<td>Paraffinic Oil</td>
<td>Rat: &gt;2000 mg/kg</td>
<td>No Information found</td>
<td>No Information found</td>
</tr>
<tr>
<td>Polassium Chlorate</td>
<td>Rat: 1870 mg/kg</td>
<td>Rabbit: &gt;2000 mg/kg</td>
<td>No Information found</td>
</tr>
<tr>
<td>Waxy sawdust</td>
<td>Rat: &gt;5000 mg/kg</td>
<td>not stated</td>
<td>not stated</td>
</tr>
<tr>
<td>Polyvinyl Chloride</td>
<td>Rat: &gt;5000 mg/kg</td>
<td>No Information found</td>
<td>No Information found</td>
</tr>
<tr>
<td>Shellac</td>
<td>Rat: 10000 mg/kg</td>
<td>No Information found</td>
<td>No Information found</td>
</tr>
<tr>
<td>Charcoal</td>
<td>Rat: 15400 mg/kg</td>
<td>Rabbit: 3 g/kg</td>
<td>No Information found</td>
</tr>
</tbody>
</table>

Product toxicological information

Acute Toxicity: Not classified – Acute Toxicity Estimate yields oral LD50 over 5000 mg/kg bw

Skin Iritation / Corrosion: Category 2 – over 10% of ingredients classified as a Category 2

Serious Eye Damage / Irritation: Category 2a – over 10% of ingredients classified as a Category 2a

Respiratory / Skin Sensitization: Not classified (Based on available data, the classification criteria are not met)

Germ Cell Mutagen: Not classified (Based on available data, the classification criteria are not met)

Carcinogen: Not classified (Based on available data, the classification criteria are not met)

Reproductive Toxicity: Not classified (Based on available data, the classification criteria are not met)

STOT – single exposure: Category 3 – respiratory over 10% of ingredients classified as a Category 3 respiratory STOT hazard

STOT – repeated exposure: Not classified (Based on available data, the classification criteria are not met)

Aspiration Hazard: Not classified (Based on available data, the classification criteria are not met)

Likely routes of exposure: Skin, ingestion, inhalation

Symptoms related to the physical, chemical and toxicological characteristics: Contents irritating to eyes due to chemical and physical properties of the mixture. Inhalation of contents may cause gastrointestinal irritation with nausea, vomiting and diarrhea. Inhalation of contents or smoke from burning flare will cause irritation to the lungs and mucous membrane. Prolonged or repeated skin contact with contents may cause dermatitis.

Delayed and immediate effects and chronic effects from short and long term exposure: Inhalation of contents or smoke from burning flare will cause irritation to the lungs and mucous membrane. Prolonged or repeated skin contact with contents may cause dermatitis.

Interactive effects: Inhalation of contents or smoke from burning flare will cause irritation to the lungs and mucous membrane. Prolonged or repeated skin contact with contents may cause dermatitis.

12. Ecological Information

Ingredient toxicity / persistence / degradability / bioaccumulation / mobility in soil and water

Aquatic Toxicity: Strontium Nitrate: Acute toxicity - Fishes, Carassius auratus. LC100, 9,615 mg/l; Chronic toxicity - Fishes, Gasterosteus aculeatus. LC100, 2.912 mg/l

Sulfur: Toxicity to fish LC50 - Oncorhynchus mykiss (rainbow trout) > 180 mg/l - 96 h. Toxicity to daphnia and other aquatic invertebrates: EC50 - Daphnia magna (Water flea) > 5,000 mg/l - 48 h

Potassium Chlorate: Fish: LC50 Oncorhynchus mykiss (rainbow trout) 1750 mg/l - 96 hr, EC50 daphnia magna (water flea) 1093 mg/l, 24 hr

Paraffinic Oil: Oil Mfd, Minor Lepomis macrochirus (LC50) 96 hour(s) >100 mg/l; Oncorhynchus mykiss (LC50) 96 hour(s) >100 mg/l

Potassium Nitrate: Fish: Guppy (Poecilia reticulata) LC50 180 mg/l, (96 hr), zooplankton: Daphnia magna LC50 490 mg/l - 48hr

Persistence / Degradability: Potassium Nitrate: Soluble in water. Persistence is unlikely based on information available.

Bioaccumulation / Accumulation: No information found

Mobility in Environmental Media: Strontium Nitrate: Water: considerable solubility and mobility; Soil/sediments: non-significant adsorption

Other adverse effects: No information found
## 13. Disposal Considerations

### Disposal methods
Flares should be allowed to burn to completion. Partially burned or unburned flares, spilled contents, and ash from burned flares should be disposed of in accordance with federal, state, and local requirements. Consult factory for any additional disposal concerns.

## 14. Transportation Information

<table>
<thead>
<tr>
<th>Description</th>
<th>ID Number</th>
<th>Shipping Name</th>
<th>Hazard Class</th>
<th>Packing Group</th>
<th>EX Number</th>
<th>Reportable Quantities</th>
<th>Shipping Method</th>
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<tbody>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Bulk flares</td>
<td>NA1325</td>
<td>Fusée</td>
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<td>II</td>
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<td>none</td>
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<td>Retail packaged flares</td>
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<td>ORHA / Limited</td>
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<td>Not applicable</td>
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</table>

### Marine Pollutant
- No

### Special precautions for user
- No information available

## 15. Regulatory Information

<table>
<thead>
<tr>
<th>US Regulations</th>
<th>TSCA</th>
<th>CERCLA</th>
<th>CWA</th>
<th>CAA</th>
<th>SARA</th>
<th>311</th>
<th>302</th>
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<td>no</td>
<td>no</td>
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<table>
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<tr>
<th>US States</th>
<th>Prop 65</th>
<th>NJ</th>
<th>PA</th>
<th>Canada</th>
<th>WHMIS</th>
<th>DSL</th>
<th>Europe</th>
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<tbody>
<tr>
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</tr>
</tbody>
</table>

## 16. Other Information

### Revision Information
- May 2015

### NFPA Rating
- Flammability: 1
- Health: 2
- Reactivity: 1

### HMIS Rating
- Flammability: 1
- Health: 2
- Physical Hazard: 1

### Key / Legend
- TSCA: Toxic Substance Control Act
- CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act
- CWA: Clean Water Act
- CAA: Clean Air Act
- SARA: Superfund Amendments and Reauthorization Act
- NFPA: National Fire Protection Association
- CAS: Chemical Abstracts Service number
- EMERG: European inventory of existing chemicals
- OSHA PEL: Occupational Safety and Health Administration Permissible Exposure Limit
- NFIB: National Institute for Occupational Safety and Health Threshold Limit Value
- TSCA: Toxic Substances Control Act
- CSHIA: California's Safe Harbor for Internationally Agreed Chemicals
- California's Proposition 65 list
- WHMIS: Workplace Hazardous Materials Information System
- DSL: Domestic Substances List - Canada
- WtG: Water Hazard Classes - Germany

### Legal Statement
This information is accurate to the best knowledge Orion Safety Products. Orion Safety Products makes no representations or warranties, express or implied, including without limitation any warranties of merchantability or fitness for a particular purpose, with respect to the information in this document or the product to which the information relates. Accordingly, Orion Safety Products shall not be responsible for damages resulting from or in reliance upon this information. Any person utilizing this document should seek competent professional advice to verify and assume responsibility for the suitability of this information to their particular situation.
SAFETY DATA SHEET

1. Product and Company Identification

**Fusee – contains perchlorate**

Identification: The fusee containing perchlorate will have the following warning on it:

> Perchlorate Material – special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate.

**Synonyms:**

- Emergency Road Flare / Railway Flare
- Backfire Torches (p/n 4100)

**NSN#:**

- 1370-01-009-2593
- 1370-00-294-127

**Manufacturers Information**

Orion Safety Products
28320 St. Michaels Rd
Easton, MD 21601
800-637-7807
410-822-0318

**Use Advised Against:**

Do not use indoors or inside a vehicle

**Emergency**

CHEMTREC
1-800-424-9300

2. Hazards Identification

**GHS Classifications**

- Skin Irritation: Category 2 - H315
- Eye Irritation: Category 2A - H319
- STOT - Single Exposure: Category 3 - H335

**GHS Label Elements**

- **Signal Word:** Warning
- **Pictograms:**
  - H315: Causes skin and serious eye irritation
  - H335: May cause respiratory irritation

**Precautionary Statements**

- P103: Keep out of reach of children
- P261: Avoid breathing dust/smoke
- P264: Wash hands thoroughly after handling
- P270: Do not eat, drink or smoke when using this product
- P280: Wear protective eye protection
- P305/351/338/351: If SWALLOWED: Get immediate medical advice /attention.
- P302/303: IF ON SKIN: Wash with plenty of soap and water.
- P304/305/381/36: IF IN EYES: Rinse cautiously with water for several minutes.
- P304/305/381/36: Do not use boric acid; rinse with sulfur is an acid irritant. Get medical advice /attention.
- P304/305/381/36: If skin irritation or rash occurs, get medical advice /attention.
- P304/305/381/36: If inhaled: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If experiencing respiratory symptoms: Call a POISON CENTER or doctor / physician.
- P304/305/381/36: If skin irritation or rash occurs, get medical advice /attention.
- P304/305/381/36: In case of fire: use water deluge.
- P304/305/381/36: Avoid release to the environment

**Hazard Statements**

- H315 / H335 CAUSES SKIN AND SERIOUS EYE IRRITATION
- H319 MAY CAUSE RESPIRATORY IRRITATION

**Hazards Not Otherwise Classified (HNOC):** produces hot flame

3. Composition / Information on Ingredients

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS #</th>
<th>EINCS #</th>
<th>% Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strontium Nitrate</td>
<td>10642-76-9</td>
<td>233-131-9</td>
<td>&lt;75%</td>
</tr>
<tr>
<td>Sulfur</td>
<td>7704-34-9</td>
<td>231-722-6</td>
<td>&lt;25%</td>
</tr>
<tr>
<td>Potassium Perchlorate</td>
<td>7778-74-7</td>
<td>231-912-9</td>
<td>&lt;25%</td>
</tr>
<tr>
<td>Paraffinic Oil</td>
<td>64742-54-7</td>
<td>232-384-2</td>
<td>&lt;10%</td>
</tr>
<tr>
<td>Waxy sawdust mixture</td>
<td>none</td>
<td>&lt;5%</td>
<td></td>
</tr>
</tbody>
</table>

Note: Due to Confidential Business Information i.e. "Trade Secrets", the exact percentage of each ingredient has not been disclosed. CBI information will be shared with appropriate authorities if circumstances warrant.

4. First Aid Measures

**Description of first aid measures**

- **Inhalation:** If contents are inhaled, remove to fresh air. Watch for signs of allergic reaction. If other symptoms develop, get medical aid immediately.
- **Skin:** If contents are contacted, wash with area with soap and water for 15 minutes. Remove contaminated clothing and wash before reuse. Get medical aid immediately if burned or irritation occurs.
- **Eyes:** If contents get into eyes, flush with plenty of water for at least 15 minutes, occasionally lifting the upper and lower lids. Remove contact lenses if easily possible. Do not use boric acid to rinse with; sulfur is an acid irritant. Get medical aid immediately.
- **Ingestion:** Get medical aid immediately.

**Most important symptoms and effects both acute and delayed**

See section 2 labeling and section 11

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

Burning fusee can cause severe burns if in contact with body. For burns to skin, cool with water and bandage.
5. Firefighting Measures

Extinguishing Media
Water deluge

Unsuitable Extinguishing Media
Foam and dry chemical extinguishers and suffocation are ineffective.

Protective Equipment and Precautions for Firefighters
Wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full face piece operated in the pressure demand or other positive pressure mode. Prevent further propagation of fire by spraying unburnt nearby product with water. Combat fire from a sheltered position.

Specific Hazards Arising from the Chemical
Use copious amounts of water to extinguish fire comprised of fusees. Fusees contain oxidizers and will continue to burn unless a significant amount of water is used. Do not breathe smoke.

Further information
No data available

6. Accidental Release Measures

Personal Precautions / Protective Equipment / Emergency Procedures
Do not breathe contents and avoid contact with skin and eyes. Wear flame retardant clothing with long sleeves, dust mask, rubber or nitrile gloves, safety goggles, safety shoes. Avoid friction on the released product. Keep away from ignition sources.

Environmental Precautions
Prevent dispersion of contents on soil and in water. Prevent contents from spreading or entering into drains, ditches, groundwater or rivers by using appropriate barriers.

Methods for Containment and Clean-up
Use caution when cleaning up spilled product contents. Remove heat, flames, sparks and other sources of ignition. Use non-sparking tools and equipment. Prevent buildup of electrostatic charges by grounding. Clean spills in a manner that does not disperse dust into the air. Do not absorb in sawdust or other combustible absorbents. Pick up spill for recovery or disposal and place in an approved container. Wash away remainder with plenty of water. Collect wash water for approved disposal.

7. Handling and Storage

Precautions for Safe Handling
Hold and point fuseeS away from body when igniting. Exercise caution when using this product as molten flocks may be emitted. Burning fuseeS can cause severe burns if in contact with body. Avoid contact with clothing and other combustible materials. Wear eye protection during use. Follow instructions on package. Use outdoors only. Do not ignite or burn product inside a vehicle, warehouse, or other building. Prevent contents from spreading or entering into drains, ditches, groundwater or rivers by using appropriate barriers.

Conditions for Safe Storage, Including Any Incompatibilities
Store away from direct sunlight, heat and incompatible materials. See section 10. Store away from food and beverages. Store away from flammable materials, sources of heat, flame and sparks. Store at ambient temperature. Do not store partially burned fusees in a vehicle, warehouse, or any other building. Plastic bags are provided for moisture protection. Keep partially used bags sealed at all times.

8. Exposure Controls / Personal Protection

Control parameters

<table>
<thead>
<tr>
<th>Exposure Limits</th>
<th>OSHA PEL</th>
<th>ACGIH TLV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strontium Nitrate</td>
<td>Not Established</td>
<td>Not Established</td>
</tr>
<tr>
<td>Sulfur</td>
<td>Not Established</td>
<td>Not Established</td>
</tr>
<tr>
<td>Potassium Perchlorate</td>
<td>Nuisance dust 15 mg/m³</td>
<td>Nuisance dust 15 mg/m³</td>
</tr>
<tr>
<td>Paraffinic Oil</td>
<td>5 mg/m³</td>
<td>TWA 5 mg/m³</td>
</tr>
<tr>
<td>Waxy sawdust</td>
<td>Not Established</td>
<td>Not Established</td>
</tr>
</tbody>
</table>

Exposure controls

Engineering Controls
Use product outdoors only! When cleaning up contents, use local and/or general exhaust.

Personal Protective Equipment

Eye / Face Protection
Safety glasses or goggles

Skin Protection
None under normal conditions when using product unless prolonged handling is anticipated. Impervious protective clothing, including gloves, boots, and a lab coat, apron or coveralls, as appropriate, when cleaning up spilled product. Wash hands and face before eating, drinking or using tobacco products.

Respiratory Protection
None under normal conditions when using product. A particulate respirator (NIOSH or N95 or better filters) may be worn during the cleanup of spilled materials.

General Hygiene
Use product outdoors away from combustible products. For cleanup of spilled materials, emergency showers and eye wash stations should be available. Educate and train employees in the safe use and handling of hazardous materials.

9. Physical and Chemical Properties

Appearance (color, physical form, shape): Yellow to grey powder

pH: Not available

Boiling Point / Range: Not applicable

Vapor Pressure: Not applicable

Odor: No data available

Flammability: Not applicable

Melting Point: Not applicable

Freezing Point: Not applicable

Specific Gravity: Not applicable

Odor Threshold: No data available

Flammability Limits: No data available

Solubility: Not available

Evaporation Rate: Not applicable

Vapor Density: Not applicable

Flash Point: Not applicable

Relative Density: No data available

pc fusee
### 10. Stability and Reactivity

**Chemical Stability**: Stable  
**Reactivity**: No information available  
**Conditions to Avoid**: Combustible materials, heat, flames, sparks and other sources of ignition. Moisture.  
**Incompatible Materials**: Strong acids, strong fuels, ammonia salts, and strong bases. Strong oxidizers; chloride salts.  
**Delayed and Immediate Effects and Chronic Effects from Short and Long Term Exposure**

**Likely routes of exposure**
- Skin, ingestion, inhalation
- Contents irritating to eyes due to chemical and physical properties of the mixture. Inhalation of contents may cause gastrointestinal irritation with nausea, vomiting and diarrhea. Individuals with known allergies to sulfide drugs may also have allergic reactions to elemental sulfur.
- Inhalation of contents or smoke from burning fusee will cause irritation to the lungs and mucous membrane. Prolonged or repeated skin contact with contents may cause dermatitis. Perchlorate exposure at certain levels can disrupt the function of the thyroid gland by interfering with the iodide uptake and thyroid hormone production. This interference may lead to developmental defects. Scientists consider pregnant women, children, infants, and individuals with thyroid disorders to be the populations most at risk of harm from being exposed to perchlorate.

**Interactive effects**
- No information found

### 11. Toxicology Information

**Ingredient acute toxicity information**

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Oral LD50</th>
<th>skin LD50</th>
<th>LC50</th>
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<tr>
<td>Strontium Nitrate</td>
<td>Rat: 2750 mg/kg</td>
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<tr>
<td>Sulfur</td>
<td>Rat: 2100 mg/kg</td>
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<tr>
<td>Potassium Perchlorate</td>
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<td>No information found</td>
</tr>
<tr>
<td>Paraffinic Oil</td>
<td>No information found</td>
<td>No information found</td>
<td>No information found</td>
</tr>
<tr>
<td>Waxy sawdust</td>
<td>No information found</td>
<td>No information found</td>
<td>No information found</td>
</tr>
</tbody>
</table>

**Product toxicological information**

- **Acute Toxicity**: Not classified – Acute Toxicity Estimate yields oral LD50 over 5000 mg/kg bw
- **Skin Irritation / Corrosion**: Category 2 – over 10% of ingredients classified as a Category 2
- **Serious Eye Damage / Irritation**: Category 2a – over 10% of ingredients classified as a Category 2a
- **Respiratory / Skin Sensitization**: Not classified (Based on available data, the classification criteria are not met)
- **Germ Cell Mutagen**: Not classified (Based on available data, the classification criteria are not met)
- **Carcinogen**: Not classified (Based on available data, the classification criteria are not met)
- **Reproductive Toxicity**: Not classified (Based on available data, the classification criteria are not met)
- **STOT – single exposure**: Category 3 – respiratory over 10% of ingredients classified as a Category 3 respiratory STOT hazard
- **STOT – repeated exposure**: Not classified (Based on available data, the classification criteria are not met)
- **Aspiration Hazard**: Not classified (Based on available data, the classification criteria are not met)

**Likely routes of exposure**
- Skin, ingestion, inhalation

**Delayed and immediate effects and chronic effects from short and long term exposure**

**Symptoms related to the physical, chemical and toxicological characteristics**
- Contents irritating to eyes due to chemical and physical properties of the mixture. Inhalation of contents may cause gastrointestinal irritation with nausea, vomiting and diarrhea. Individuals with known allergies to sulfide drugs may also have allergic reactions to elemental sulfur.
- Inhalation of contents or smoke from burning fusee will cause irritation to the lungs and mucous membrane. Prolonged or repeated skin contact with contents may cause dermatitis. Perchlorate exposure at certain levels can disrupt the function of the thyroid gland by interfering with the iodide uptake and thyroid hormone production. This interference may lead to developmental defects. Scientists consider pregnant women, children, infants, and individuals with thyroid disorders to be the populations most at risk of harm from being exposed to perchlorate.

**Interactive effects**
- No information found

### 12. Ecological Information

**Ingredient toxicity / persistence / degradability / bioaccumulation / mobility in soil and water**

**Aquatic Toxicity**
- **Strontium Nitrate**: Acute toxicity - Fishes, Carassius auratus, LC100, 9,615 mg/l; Chronic toxicity - Fishes, Gasterosteus aculeatus, LC100, 2,912 mg/l.
- **Sulfur**: Toxicity to fish LC50 - Oncorhynchus mykiss (rainbow trout) > 100 mg/l; 96 h Toxicity to daphnia and other aquatic invertebrates: EC50 - Daphnia magna (Water flea) > 5,000 mg/l; 48 h
- **Paraffinic Oil**: Oil Mst, Microal Lepisne macrochir (LC50) 96 h > 100 mg/l

**Persistence / Degradability**
- No information found

**Bioaccumulation / Accumulation**
- No information found

**Mobility in Environmental Media**
- **Strontium Nitrate**: Water: considerable solubility and mobility; Soil/Sediments: non-significant adsorption

**Other adverse effects**
- No information found

### 13. Disposal Considerations

**Disposal methods**

Fusees should be allowed to burn to completion. Partially burned or unburned fusees, spilled contents, and ash from burned fusees should be disposed of in accordance with federal, state, and local requirements. Consult factory for any additional disposal concerns. Refer to California Code of Regulations, Title 33, Sections 67364.1-67364.10 for additional information on handling and disposal of potassium perchlorate containing materials.
### 14. Transportation Information

<table>
<thead>
<tr>
<th>Description</th>
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<th>hazard class</th>
<th>packing group</th>
<th>EX Number</th>
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<td>Not applicable</td>
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**Marine Pollutant:** no  
**Special precautions for user:** No information available

### 15. Regulatory Information

<table>
<thead>
<tr>
<th>US Regulations</th>
<th>TSCA</th>
<th>CERCLA</th>
<th>CWA</th>
<th>CAA</th>
<th>SARA 313</th>
<th>SARA 312</th>
<th>Acute</th>
<th>Chronic</th>
<th>Fire</th>
<th>Reactivity</th>
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<td>no</td>
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<tr>
<td>Waxy sawdust</td>
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<tr>
<th>US States</th>
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<th>NJ</th>
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<th>Canada</th>
<th>WHMIS</th>
<th>DSL</th>
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</thead>
<tbody>
<tr>
<td>Strontium Nitrate</td>
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<td>1743</td>
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<td>C Oxidizing materials D1B Toxic materials D2B</td>
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<td>not listed</td>
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<td></td>
</tr>
</tbody>
</table>

### 16. Other Information

**Revision Information:** May 2015

**NFPA Rating**  
- Flammability: 1  
- Health: 2  
- Reactivity: 1  

**HMIS Rating**  
- Flammability: 1  
- Health: 2  
- Physical Hazard: 1

**Key / Legend:**
- NFPA: hazardous material identification system  
- SARA: Superfund Amendments and Reauthorization Act  
- TSCA: Toxic Substances Control Act - US  
- CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act - US  
- CWA: Clean Water Act - US  
- CAA: Clean Air Act - US  
- SARA: Superfund Amendments and Reauthorization Act - US  
- Prop 85: California’s Proposition 85 list  
- WHMIS: Workplace Hazardous Materials Information System - Canada  
- DSL: Domestic Substances List - Canada  
- CAA: Clean Air Act - US  
- EU: European Union  
- TGID: Toxic Substance Information Act - US  
- TWA: Time-Weighted Average  
- TLV: Threshold Limit Value  
- GHS: Globally Harmonized System of Classification and Labeling of Chemicals

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