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

1.1 Product identifier
- Trade name STRONTIUM CARBONATE SF

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

Uses of the Substance / Mixture
- Manufacture of pyrotechnical products
- Use in welding electrode coating
- Manufacture of glazes, frits and enamels
- Manufacture of ceramics
- Manufacture of electro-ceramic materials
- Manufacture of other strontium compounds
- Use in zinc electrolysis

Uses advised against
- none

1.3 Details of the supplier of the safety data sheet

Company
SOLVAY FLUORIDES, LLC
3333 RICHMOND AVENUE
77098-3099, HOUSTON
USA
Tel: +1-800-7658292; +1-713-5256700
Fax: +1-713-5257805

Prepared by
Solvay Product Stewardship (see Telephone number above)

Date Prepared
05/08/2015

1.4 Emergency telephone

FOR EMERGENCIES INVOLVING A SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT CONTACT: CHEMTREC 800-424-9300 within the United States and Canada, or 703-527-3887 for international collect calls.

SECTION 2: Hazards identification

2.1 Emergency overview

Appearance
Form: hygroscopic, powder, pellets
Physical state: solid
    solid
Color: white white
Odor: odorless

Warning statements
- Product dust may be irritating to eyes, skin and respiratory system.
- Possible risk of irreversible effects through inhalation.
- Risk of pulmonary overload (respirable particulates)
- Harmful: possible risk of irreversible effects through inhalation.
- Chronic exposure to the product can cause bone calcification disorders.

2.2 Potential Health Effects

**Inhalation effect**
- May cause nose, throat, and lung irritation.
- Repeated or prolonged exposure
- Risk of pulmonary overload (respirable particulates)
- Possible risk of irreversible effects through inhalation.

**Skin effect**
- Prolonged skin contact may cause skin irritation.

**Eye effect**
- Contact with eyes may cause irritation.

**Ingestion effect**
- Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

**Chronic effects**
- This product does not contain any ingredient designated by IARC or ACGIH as probable or suspected human carcinogens.

### SECTION 3: Composition/information on ingredients

#### 3.1 Information on Components and Impurities

**WHMIS Hazardous Ingredients and Impurities**

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Identification number CAS-No.</th>
<th>Concentration [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barium carbonate</td>
<td>513-77-9</td>
<td>&lt;= 2.5</td>
</tr>
</tbody>
</table>

**Non Hazardous Ingredients and Impurities**

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Identification number CAS-No.</th>
<th>Concentration [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strontium carbonate</td>
<td>1633-05-2</td>
<td>&gt;= 96</td>
</tr>
</tbody>
</table>

### SECTION 4: First aid measures

#### 4.1 Description of first-aid measures

**In case of inhalation**
- Move to fresh air.
- If symptoms persist, call a physician.

**In case of skin contact**
- Wash off with soap and water.
In case of eye contact
- Rinse thoroughly with plenty of water, also under the eyelids.
- If eye irritation persists, consult a specialist.

In case of ingestion
- Rinse mouth with water.
- Do NOT induce vomiting.

4.2 Most important symptoms and effects, both acute and delayed

In case of inhalation
Effects
- May cause nose, throat, and lung irritation.
  Repeated or prolonged exposure
  - Risk of pulmonary overload (respirable particulates)
  - Possible risk of irreversible effects through inhalation.

In case of skin contact
Effects
- Prolonged skin contact may cause skin irritation.

In case of eye contact
Effects
- Contact with eyes may cause irritation.

In case of ingestion
Effects
- Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

4.3 Indication of any immediate medical attention and special treatment needed
- no data available

SECTION 5: Firefighting measures

Flash point Not applicable

Autoignition temperature Not applicable

Flammability / Explosive limit no data available

5.1 Extinguishing media
Suitable extinguishing media
- Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media
- None.

5.2 Special hazards arising from the substance or mixture
Specific hazards during fire fighting
- Not combustible.
Hazardous combustion products:
- Strontium oxide
- Barium oxide

5.3 Advice for firefighters

Special protective equipment for fire-fighters
- In the event of fire, wear self-contained breathing apparatus.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel
- Evacuate personnel to safe areas.
- Avoid dust formation.

Advice for emergency responders
- Sweep up to prevent slipping hazard.
- Prevent further leakage or spillage.

6.2 Environmental precautions
- Should not be released into the environment.
- Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and materials for containment and cleaning up
- Sweep up and shovel into suitable containers for disposal.

6.4 Reference to other sections
- Refer to protective measures listed in sections 7 and 8.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
- Ensure adequate ventilation.
- Minimize dust generation and accumulation.
- Avoid contact with skin and eyes.
- Keep away from incompatible products

Hygiene measures
- When using do not eat, drink or smoke.
- Wash hands before breaks and at the end of workday.
- Handle in accordance with good industrial hygiene and safety practice.

7.2 Conditions for safe storage, including any incompatibilities
**Technical measures/Storage conditions**
- Store in original container.
- Store in a well-ventilated place.
- Keep in a dry place.
- Keep container closed.
- Keep away from:
  - Incompatible products

**Packaging material**

**Suitable material**
- Paper.
- Polyethylene

7.3 Specific end use(s)
- Contact your supplier for additional information

### SECTION 8: Exposure controls/personal protection

**Introductory Remarks:** These recommendations provide general guidance for handling this product. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. Assistance with selection, use and maintenance of worker protection equipment is generally available from equipment manufacturers.

8.1 Control parameters

**Components with workplace occupational exposure limits**

Consult local authorities for acceptable exposure limits.

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Value type</th>
<th>Value</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barium carbonate</td>
<td>TWA</td>
<td>0.5 mg/m3</td>
<td>American Conference of Governmental Industrial Hygienists</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Eye, skin, &amp; Gastrointestinal irritation, Muscular stimulation, Not classifiable as a human carcinogen Expressed as Barium</td>
</tr>
</tbody>
</table>

8.2 Exposure controls

**Control measures**

**Engineering measures**
- Provide appropriate exhaust ventilation at places where dust is formed.

**Individual protection measures**

**Respiratory protection**
- Use only respiratory protection that conforms to international/ national standards.
- Use NIOSH approved respiratory protection.
- Respirator with a particle filter (EN 143)

**Hand protection**
- Wear suitable gloves.

**Suitable material**
- PVC
- Natural Rubber

**Unsuitable material**
- Do not wear neoprene gloves, as neoprene absorbs nanoparticles.
Eye protection
- Goggles

Skin and body protection
- Dust impervious protective suit
- PVC
- Suitable material
- PVC

Hygiene measures
- When using do not eat, drink or smoke.
- Wash hands before breaks and at the end of workday.
- Handle in accordance with good industrial hygiene and safety practice.

SECTION 9: Physical and chemical properties

Physical and Chemical properties here represent typical properties of this product. Contact the business area using the Product information phone number in Section 1 for its exact specifications.

9.1 Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance</strong></td>
<td>hygroscopic, powder, pellets</td>
</tr>
<tr>
<td><strong>Physical state</strong></td>
<td>solid</td>
</tr>
<tr>
<td><strong>Color</strong></td>
<td>white</td>
</tr>
<tr>
<td><strong>Particle size</strong></td>
<td>0.74 - 10 µm</td>
</tr>
<tr>
<td></td>
<td>d 50, nano particles, powder</td>
</tr>
<tr>
<td></td>
<td>&gt; 0.15 - 0.85 mm (80%)</td>
</tr>
<tr>
<td><strong>Odor</strong></td>
<td>odorless</td>
</tr>
<tr>
<td><strong>Odor Threshold</strong></td>
<td>no data available</td>
</tr>
<tr>
<td><strong>pH</strong></td>
<td>7.0 - 8.0 (68 °F (20 °C))</td>
</tr>
<tr>
<td></td>
<td>saturated aqueous solution</td>
</tr>
<tr>
<td><strong>pKa</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Melting point/range</strong></td>
<td>Decomposition: yes</td>
</tr>
<tr>
<td></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Boiling point/boiling range</strong></td>
<td>Thermal decomposition: yes</td>
</tr>
<tr>
<td></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Flash point</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Evaporation rate (Butylacetate = 1)</strong></td>
<td>Not applicable</td>
</tr>
</tbody>
</table>
**SAFETY DATA SHEET**

**STRONTIUM CARBONATE SF**

**Revision Date** 05/08/2015

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**Flammability (solid, gas)**
The product is not flammable.

**Flammability / Explosive limit**
Explosiveness:
Not explosive

**Autoignition temperature**
Not applicable

**Vapor pressure**
Not applicable

**Vapor density**
Not applicable

**Density**
- **Bulk density:**
  - 300 - 700 kg/m³ powder
  - 1,200 - 2,000 kg/m³ pellets
- **Relative density:** 3.79

**Solubility**
Water solubility:
- 3.4 mg/l (68 °F (20 °C))
  - slightly soluble

**Partition coefficient: n-octanol/water**
Not applicable

**Thermal decomposition**
ca. 1233 °F (667 °C)

**Viscosity**
Viscosity, dynamic:
- Not applicable

**Explosive properties**
no data available

**Oxidizing properties**
Not considered as oxidizing.

**9.2 Other information**

**Molecular weight**
147.6 g/mol

---

**SECTION 10: Stability and reactivity**

10.1 Reactivity
- Risk of violent reaction.

10.2 Chemical stability
- Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
- Contact with acids liberates CO₂, sometimes violently.

10.4 Conditions to avoid
10.5 Incompatible materials
- Acids

10.6 Hazardous decomposition products
- Strontium oxide
- Barium oxide

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Acute oral toxicity
Strontium nitrate  
LD50: > 2,000 mg/kg - Rat

Strontium chloride anhydrous  
LD50: > 2,000 mg/kg - Rat  
Test substance: Strontium nitrate

Acute inhalation toxicity
Strontium nitrate  
LC50 - 4 h: 4.5 mg/l - Rat

Strontium chloride anhydrous  
LC50: 4.5 mg/l - Rat  
Test substance: Strontium nitrate

Acute dermal toxicity  
study scientifically unjustified

Acute toxicity (other routes of administration)  
no data available

Skin corrosion/irritation
Strontium chloride anhydrous  
Skin irritation

Serious eye damage/eye irritation
Strontium chloride anhydrous  
Eye irritation

Respiratory or skin sensitization
Strontium chloride anhydrous  
not sensitizing  
Test substance: Strontium Chloride Hexahydrate

Mutagenicity

Genotoxicity in vitro
Strontium nitrate  
In vitro tests did not show mutagenic effects

Strontium chloride anhydrous  
Test substance: Strontium nitrate  
In vitro tests did not show mutagenic effects

Genotoxicity in vivo  
no data available
Carcinogenicity

Strontium nitrate  Animal testing did not show any carcinogenic effects.

This product does not contain any ingredient designated as probable or suspected human carcinogens by:
IARC
ACGIH

Toxicity for reproduction and development

Toxicity to reproduction / fertility

Strontium nitrate  Animal testing did not show any effects on fertility.
observed effect
Developmental Toxicity

Strontium chloride anhydrous  Animal testing did not show any effects on fertility.

Developmental Toxicity/Teratogenicity

Strontium nitrate  Developmental Toxicity
observed effect

Strontium chloride anhydrous  Developmental Toxicity
observed effect

STOT

STOT-single exposure

Strontium chloride anhydrous  no observed effect

STOT-repeated exposure

Oral Repeated exposure - Rat
Target Organs: Skeleton
observed effect

Inhalation Single exposure - Rat
Target Organs: Respiratory system
observed effect

Oral - Rat
LOAEL: 634 mg/kg
Target Organs: Skeleton

CMR effects

Carcinogenicity

Strontium chloride anhydrous  Animal testing did not show any carcinogenic effects.

Teratogenicity

Strontium nitrate  Did not show teratogenic effects in animal experiments.
Aspiration toxicity

no data available

Further information

Strontium chloride anhydrous

No data is available on the product itself.

SECTION 12: Ecological information

12.1 Toxicity

Aquatic Compartment

Acute toxicity to fish

Aquatic toxicity is unlikely due to low solubility.

Toxicity to aquatic plants

Strontium nitrate

NOEC - 72 h : >= 104.5 mg/l - Pseudokirchneriella subcapitata (green algae)
Growth rate

Strontium chloride anhydrous

EC50 - 72 h : > 104.7 mg/l - Pseudokirchneriella subcapitata (microalgae)
Test substance: Strontium nitrate
NOEC - 72 h : >= 104.7 mg/l - Pseudokirchneriella subcapitata (microalgae)
Test substance: Strontium nitrate

Chronic toxicity to fish

NOEC: >= 100 mg/l - 34 Days - Brachydanio rerio (zebrafish)
mortality
fish larvae

Chronic toxicity to daphnia and other aquatic invertebrates.

Strontium chloride anhydrous

NOEC: 21 mg/l - 21 Days - Daphnia magna (Water flea)

12.2 Persistence and degradability

Abiotic degradation

Photodegradation

slow ionization and cation precipitation in presence of sulfates or carbonates
Medium
Water
Soil

considerable adsorption
Medium
Soil

Biodegradation

Biodegradability

The methods for determining biodegradability are not applicable to inorganic substances.
12.3 Bioaccumulative potential

Bioconcentration factor (BCF)  potential accumulation of the cation

12.4 Mobility in soil

Adsorption potential (Koc)  Water/soil
low solubility and mobility

12.5 Results of PBT and vPvB assessment  no data available

12.6 Other adverse effects  no data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product Disposal
- Where possible recycling is preferred to disposal or incineration.
- If recycling is not practicable, dispose of in compliance with local regulations.
- Must be incinerated in a suitable incineration plant holding a permit delivered by the competent authorities.
- Dispose of wastes in an approved waste disposal facility.
- In accordance with local and national regulations.

Advice on cleaning and disposal of packaging
- Dispose of as unused product.
- Where possible recycling is preferred to disposal or incineration.

SECTION 14: Transport information

TDG  not regulated

DOT  not regulated

NOM  not regulated

IMDG  not regulated

IATA  not regulated

Note: The above regulatory prescriptions are those valid on the date of publication of this sheet. Given the possible evolution of transportation regulations for hazardous materials, it would be advisable to check their validity with your sales office.
SECTION 15: Regulatory information

15.1 Notification status

<table>
<thead>
<tr>
<th>Inventory Information</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States TSCA Inventory</td>
<td>Listed on Inventory</td>
</tr>
<tr>
<td>Mexico INSQ (INSQ)</td>
<td>In compliance with the inventory</td>
</tr>
<tr>
<td>Canadian Domestic Substances List (DSL)</td>
<td>Listed on Inventory</td>
</tr>
<tr>
<td>New Zealand. Inventory of Chemical Substances</td>
<td>In compliance with the inventory</td>
</tr>
<tr>
<td>Australia Inventory of Chemical Substances (AICS)</td>
<td>Listed on Inventory</td>
</tr>
<tr>
<td>Japan. CSCL - Inventory of Existing and New Chemical Substances</td>
<td>Listed on Inventory</td>
</tr>
<tr>
<td>Korea. Korean Existing Chemicals Inventory (KECI)</td>
<td>Listed on Inventory</td>
</tr>
<tr>
<td>China. Inventory of Existing Chemical Substances in China (IECSC)</td>
<td>Listed on Inventory</td>
</tr>
<tr>
<td>Philippines Inventory of Chemicals and Chemical Substances (PICCS)</td>
<td>Listed on Inventory</td>
</tr>
</tbody>
</table>

15.2 WHMIS (Workplace Hazardous Materials Information System) Classification

This product has been classified according to the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR.

**Classification**

D2B: Toxic Material Causing Other Toxic Effects

15.3 Other regulations

no data available

SECTION 16: Other information

**NFPA (National Fire Protection Association) - Classification**

<table>
<thead>
<tr>
<th>Health</th>
<th>1 slight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammability</td>
<td>0 minimal</td>
</tr>
<tr>
<td>Instability or Reactivity</td>
<td>0 minimal</td>
</tr>
<tr>
<td>Special Notices</td>
<td>None</td>
</tr>
</tbody>
</table>

**HMIS (Hazardous Materials Identification System (Paint & Coating)) - Classification**

<table>
<thead>
<tr>
<th>Health</th>
<th>1 slight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammability</td>
<td>0 minimal</td>
</tr>
<tr>
<td>Reactivity</td>
<td>0 minimal</td>
</tr>
<tr>
<td>PPE</td>
<td>Determined by User; dependent on local conditions</td>
</tr>
</tbody>
</table>

Key or legend to abbreviations and acronyms used in the safety data sheet

- **TWA** 8-hour, time-weighted average
- **ACGIH** American Conference of Governmental Industrial Hygienists
- **OSHA** Occupational Safety and Health Administration
- **NTP** National Toxicology Program
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information, and belief at the date of its publication. Such information is only given as a guidance to help the user handle, use, process, store, transport, dispose, and release the product in satisfactory safety conditions and is not to be considered as a warranty or quality specification. It should be used in conjunction with technical sheets but do not replace them. Thus, the information only relates to the designated specific product and may not be applicable if such product is used in combination with other materials or in any other manufacturing process, unless otherwise specifically indicated. It does not release the user from ensuring he is in conformity with all regulations linked to its activity.