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

1.1 Product identifier
- Trade name: STRONTIUM CARBONATE Granules
- Chemical name: Strontium carbonate
- Molecular formula: SrCO3

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
3737 Buffalo Speedway,
Suite 800,
Houston, TX 77098
USA
Tel: 800-515-6065

1.4 Emergency telephone
FOR EMERGENCIES INVOLVING A SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT, CONTACT CHEMTREC (24-Hour Number): 800-424-9300 within the United States and Canada, or 703-527-3887 for international collect calls.

SECTION 2: Hazards identification

Although OSHA has not adopted the environmental portion of the GHS regulations, this document may include information on environmental effects.

2.1 Classification of the substance or mixture

HCS 2012 (29 CFR 1910.1200)
- Not a hazardous product according to the OSHA Globally Harmonized System (GHS).

2.2 Label elements

HCS 2012 (29 CFR 1910.1200)
- Not a hazardous product according to the OSHA Globally Harmonized System (GHS).
2.3 Other hazards which do not result in classification

- H402: Harmful to aquatic life.
- 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.

SECTION 3: Composition/information on ingredients

3.1 Substance

Hazardous Ingredients and Impurities

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Identification number</th>
<th>Concentration [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barium carbonate</td>
<td>513-77-9</td>
<td>&gt;= 1 - &lt; 5</td>
</tr>
</tbody>
</table>

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

Non Hazardous Ingredients and Impurities

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Identification number</th>
<th>Concentration [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strontium carbonate</td>
<td>1633-05-2</td>
<td>&gt;= 96</td>
</tr>
</tbody>
</table>

3.2 Mixture

Not applicable, this product is a substance.

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:
- Barium oxide
- Other hazardous decomposition products may be formed.

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
- Use personal protective equipment.
- Sweep up to prevent slipping hazard.

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
- Pick up and transfer to properly labeled containers.
- Keep in suitable, closed 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.
- Keep in a well-ventilated place.
- Keep in a dry place.
- Keep in properly labeled containers.
- Keep container closed.
- In bulk: in silo or in heap (covered and isolated from the ground) on a well-drained surface.
- Keep away from:
  - Incompatible products

Packaging material
Suitable material
- Paper.
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

<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>Occupational Safety and Health Administration</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Table Z-1 Limits for Air Contaminants</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Expressed as :Barium</td>
</tr>
<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>Expressed as :Barium</td>
</tr>
<tr>
<td>Barium carbonate</td>
<td>TWA</td>
<td>0.5 mg/m3</td>
<td>National Institute for Occupational Safety and Health</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Expressed as :Barium</td>
</tr>
</tbody>
</table>

NIOSH IDLH (Immediately Dangerous to Life or Health Concentrations)

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>CAS-No.</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barium carbonate</td>
<td>513-77-9</td>
<td>50 milligram per cubic meter</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></td>
</tr>
<tr>
<td>Physical state</td>
<td>solid</td>
</tr>
<tr>
<td>Color</td>
<td>white</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>Molecular weight</strong></td>
<td>147.6 g/mol</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/freezing point</strong></td>
<td></td>
</tr>
<tr>
<td>Melting point/range:</td>
<td>Decomposition: yes</td>
</tr>
<tr>
<td></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Initial boiling point and boiling range</strong></td>
<td></td>
</tr>
<tr>
<td>Boiling point/boiling range:</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></td>
</tr>
<tr>
<td></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Flammability (solid, gas)</strong></td>
<td>The product is not flammable.</td>
</tr>
<tr>
<td><strong>Flammability / Explosive limit</strong></td>
<td>Explosiveness:</td>
</tr>
<tr>
<td></td>
<td>Not explosive</td>
</tr>
</tbody>
</table>
Autoignition temperature  Not applicable
Vapor pressure  Not applicable
Vapor density  Not applicable
Density
Relative density  3.79
Solubility  Water solubility:
3.4 mg/l (68 °F (20 °C))
slightly soluble
Partition coefficient: n-octanol/water  Not applicable
Decomposition temperature  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
No data available

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
- none

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 carbonate  
By analogy
LD50: > 2,000 mg/kg - Rat, female  
Test substance: Strontium nitrate  
Not classified as hazardous for acute oral toxicity according to GHS.

**Acute inhalation toxicity**
Strontium carbonate  
By analogy
LC50 - 4 h (aerosol): > 4.5 mg/l - Rat, male and female  
Method: OECD Test Guideline 403  
Test substance: Strontium nitrate  
Not classified as hazardous for acute inhalation toxicity according to GHS.

**Acute dermal toxicity**
Strontium carbonate  
No data available

**Acute toxicity (other routes of administration)**
No data available

**Skin corrosion/irritation**
Strontium carbonate  
By analogy
No skin irritation  
Test substance: Strontium nitrate  
in vitro test

**Serious eye damage/eye irritation**
Strontium carbonate  
Rabbit  
No eye irritation  
Method: OECD Test Guideline 405

**Respiratory or skin sensitization**
Strontium carbonate  
By analogy
Maximization Test - Guinea pig  
Does not cause skin sensitization.  
Method: OECD Test Guideline 406  
Test substance: Strontium Chloride Hexahydrate
Mutagenicity

Genotoxicity in vitro
Strontium carbonate By analogy
In vitro tests did not show mutagenic effects

Genotoxicity in vivo
No data available

Carcinogenicity

Strontium carbonate By analogy
Test substance: 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:
NTP
IARC
OSHA

Toxicity for reproduction and development

Toxicity to reproduction / fertility
Strontium carbonate By analogy
Oral
Fertility NOAEL Parent: 287.5 mg/kg

Developmental Toxicity/Teratogenicity
Strontium carbonate By analogy
Gavage
Teratogenicity NOAEL: 144 mg/kg

STOT

STOT-single exposure
Strontium carbonate The substance or mixture is not classified as specific target organ toxicant, single exposure according to GHS criteria.

STOT-repeated exposure
Strontium carbonate The substance or mixture is not classified as specific target organ toxicant, repeated exposure according to GHS criteria.
Oral 90-day - Rat, male and female
NOAEL: 21 mg/kg
Test substance: Strontium Chloride Hexahydrate

Experience with human exposure
No data available
SECTION 12: Ecological information

12.1 Toxicity

Aquatic Compartment

Acute toxicity to fish
Strontium carbonate
LC50 - 96 h : > 97.45 mg/l - Fishes, Cyprinus sp.
Test substance: Strontium nitrate
Method: OECD Test Guideline 203
By analogy
Not harmful to fish (LC/LL50 > 100 mg/L)

Acute toxicity to daphnia and other aquatic invertebrates.
Strontium carbonate
EC50 - 48 h : 125 mg/l - Daphnia magna (Water flea)
static test
Test substance: Strontium Chloride Hexahydrate
By analogy
Not harmful to aquatic invertebrates. (EC/EL50 > 100 mg/L)

Toxicity to aquatic plants
Strontium carbonate
ErC50 - 72 h : 104.7 mg/l - Pseudokirchneriella subcapitata (green algae)
static test
Test substance: Strontium nitrate
Method: OECD Test Guideline 201
By analogy
Not harmful to algae (EC/EL50 > 100 mg/L)

NOEC - 72 h : > 104.7 mg/l - Pseudokirchneriella subcapitata (green algae)
static test
Test substance: Strontium nitrate
Method: OECD Test Guideline 201
By analogy
Growth rate
No adverse chronic effect observed up to and including the threshold of 1 mg / L.

Toxicity to microorganisms
Strontium carbonate
NOEC - 3 h : > 100 mg/l - activated sludge
static test
Test substance: Strontium nitrate
Method: OECD Test Guideline 209
By analogy
Chronic toxicity to fish
Strontium carbonate
NOEC: > 100 mg/l - 34 Days - Danio rerio (zebra fish)
semi-static test
Analytical monitoring: yes
Test substance: Strontium nitrate
Method: OECD Test Guideline 210
By analogy
No adverse chronic effect observed up to and including the threshold of 1 mg / L.

Chronic toxicity to daphnia and other aquatic invertebrates.
Strontium carbonate
NOEC: 21 mg/l - 21 Days - Daphnia magna (Water flea)
semi-static test
Analytical monitoring: yes
Test substance: Strontium Chloride Hexahydrate
By analogy
No adverse chronic effect observed up to and including the threshold of 1 mg / L.

Chronic Toxicity to aquatic plants
No data available

12.2 Persistence and degradability

Abiotic degradation
No data available

Physical- and photo-chemical elimination
No data available

Biodegradation

Biodegradability
Strontium carbonate
The methods for determining biodegradability are not applicable to inorganic substances.

12.3 Bioaccumulative potential

Partition coefficient: n-octanol/water
No data available

Bioconcentration factor (BCF)
Strontium carbonate
potential accumulation of the cation

12.4 Mobility in soil

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

Known distribution to environmental compartments
No data available
12.5 Results of PBT and vPvB assessment Not applicable

12.6 Other adverse effects

Ecotoxicity assessment

**Acute aquatic toxicity**
- Strontium carbonate: Not harmful to aquatic life (LC/LL50, EC/EL50 > 100 mg/L)

**Chronic aquatic toxicity**
- Strontium carbonate: No adverse chronic effect observed up to and including the threshold of 1 mg / L.

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.

**Waste Code**
- Environmental Protection Agency
- Hazardous Waste – YES
- RCRA Hazardous Waste (40 CFR 302)
- D005 - Barium

**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

**DOT**
- not regulated

**TDG**
- 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>- Listed on 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>- Listed on 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 Chemical Substances (PICCS)</td>
<td>- Listed on Inventory</td>
</tr>
<tr>
<td>EU. European Registration, Evaluation, Authorisation and Restriction of Chemical (REACH)</td>
<td>- If product is purchased from Solvay in Europe it is in compliance with REACH, if not please contact the supplier.</td>
</tr>
</tbody>
</table>

15.2 Federal Regulations

US. EPA EPCRA SARA Title III

SARA HAZARD DESIGNATION SECTIONS 311/312 (40 CFR 370)

No SARA Hazards

Section 313 Toxic Chemicals (40 CFR 372.65)
The following components are subject to reporting levels established by SARA Title III, Section 313:

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>CAS-No.</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barium carbonate</td>
<td>513-77-9</td>
<td>1-5%</td>
</tr>
</tbody>
</table>

Section 302 Emergency Planning Extremely Hazardous Substance Threshold Planning Quantity (40 CFR 355)
This material does not contain any components with a section 302 EHS TPQ.

Section 302 Emergency Planning Extremely Hazardous Substance Reportable Quantity (40 CFR 355)
This material does not contain any components with a SARA 302 RQ.

Section 304 Emergency Release Notification Reportable Quantity (40 CFR 355)
This material does not contain any components with a section 304 EHS RQ.
**SAFETY DATA SHEET**

**STRONTIUM CARBONATE Granules**

Revision Date 01/18/2018

**US. EPA CERCLA Hazardous Substances and Reportable Quantities (40 CFR 302.4)**

This material does not contain any components with a CERCLA RQ.

**15.3 State Regulations**

**US. California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)**

This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

**SECTION 16: Other information**

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

<table>
<thead>
<tr>
<th>Category</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>1 slight</td>
</tr>
<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>Category</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>1 slight</td>
</tr>
<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>

**Further information**

- This sheet was updated (refer to the date at the top of this page). Subheadings and text which have been modified since the previous version are indicated with two vertical bars.

**Date Prepared:** 01/18/2018

**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
- **IARC**: International Agency for Research on Cancer
- **NIOSH**: National Institute for Occupational Safety and Health

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.