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

1.1 Product identifier

- Trade name: Cobalt carbonyl (Dicobalt octacarbonyl) (Stabilized with 1-5% hexanes)
- Item number: 27-0400

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

No further relevant information available.

1.3 Details of the supplier of the safety data sheet

- Manufacturer/Supplier: Strem Chemicals, Inc.
  7 Mulliken Way
  NEWBURYPORT, MA 01950
  USA
  info@strem.com

- Further information obtainable from: Technical Department

1.4 Emergency telephone number:

- EMERGENCY: CHEMTREC: + 1 (800) 424-9300
- During normal opening times: +1 (978) 499-1600

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

- Classification according to Regulation (EC) No 1272/2008

- GHS02 flame
  Self-heat. 1 H251 Self-heating: may catch fire.

- GHS07
  Acute Tox. 4 H302 Harmful if swallowed.
  Acute Tox. 4 H332 Harmful if inhaled.
  Skin Sens. 1 H317 May cause an allergic skin reaction.

- GHS08 health hazard
  Carc. 2 H351 Suspected of causing cancer.
  STOT RE 2 H373 May cause damage to organs through prolonged or repeated exposure.

2.2 Label elements

- Labelling according to Regulation (EC) No 1272/2008
  The product is classified and labelled according to the CLP regulation.

- Hazard pictograms

- GHS02 GHS07 GHS08

- Signal word Danger

(Contd. on page 2)
Trade name: Cobalt carbonyl (Dicobalt octacarbonyl) (Stabilized with 1-5% hexanes)

- Hazard-determining components of labelling:
  octacarbonyldicobalt

- Hazard statements
  H251 Self-heating: may catch fire.
  H302+H332 Harmful if swallowed or if inhaled.
  H317 May cause an allergic skin reaction.
  H351 Suspected of causing cancer.
  H373 May cause damage to organs through prolonged or repeated exposure.

- Precautionary statements
  P101 If medical advice is needed, have product container or label at hand.
  P102 Keep out of reach of children.
  P103 Read label before use.
  P231 Handle under inert gas.
  P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
  P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor.
  P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
  P422 Store contents under inert gas.
  P403+P235 Store in a well-ventilated place. Keep cool.
  P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

- 2.3 Other hazards
  - Results of PBT and vPvB assessment
    - PBT: Not applicable.
    - vPvB: Not applicable.

SECTION 3: Composition/information on ingredients

- 3.2 Chemical characterisation: Mixtures
  - Description: Mixture of substances listed below with nonhazardous additions.

- Dangerous components:

  | CAS: 10210-68-1 | octacarbonyldicobalt | 95.0% |
  | CAS: 73513-42-5 | hexane | 5.0% |

- Additional information: For the wording of the listed risk phrases refer to section 16.

SECTION 4: First aid measures

- 4.1 Description of first aid measures
  - General information:
    Immediately remove any clothing soiled by the product.
    Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
  - After inhalation:
    Supply fresh air and to be sure call for a doctor.
    In case of unconsciousness place patient stably in side position for transportation.
  - After skin contact:
    Immediately wash with water and soap and rinse thoroughly.
  - After eye contact:
    Rinse opened eye for several minutes under running water. Then consult a doctor.
  - After swallowing:
    Call for a doctor immediately.
Safety data sheet
according to 1907/2006/EC, Article 31

Trade name: Cobalt carbonyl (Dicobalt octacarbonyl) (Stabilized with 1-5% hexanes)

- 4.2 Most important symptoms and effects, both acute and delayed No further relevant information available.
- 4.3 Indication of any immediate medical attention and special treatment needed
  No further relevant information available.

SECTION 5: Firefighting measures

- 5.1 Extinguishing media
- Suitable extinguishing agents:
  CO2, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- 5.2 Special hazards arising from the substance or mixture
  During heating or in case of fire poisonous gases are produced.
- 5.3 Advice for firefighters
- Protective equipment: Mouth respiratory protective device.

SECTION 6: Accidental release measures

- 6.1 Personal precautions, protective equipment and emergency procedures
  Mount respiratory protective device.
  Wear protective equipment. Keep unprotected persons away.
- 6.2 Environmental precautions: No special measures required.
- 6.3 Methods and material for containment and cleaning up:
  Dispose contaminated material as waste according to item 13.
  Ensure adequate ventilation.
- 6.4 Reference to other sections
  See Section 7 for information on safe handling.
  See Section 8 for information on personal protection equipment.
  See Section 13 for disposal information.

SECTION 7: Handling and storage

- 7.1 Precautions for safe handling
  Thorough dedusting.
  Ensure good ventilation/exhaustion at the workplace.
  Open and handle receptacle with care.
- Handling: Handle under inert gas.
- Information about fire - and explosion protection:
  Keep ignition sources away - Do not smoke.
  Keep respiratory protective device available.
- 7.2 Conditions for safe storage, including any incompatibilities
- Storage:
  Keep cool.
  Store contents under inert gas.
- Requirements to be met by storerooms and receptacles: No special requirements.
- Information about storage in one common storage facility: Not required.
- Further information about storage conditions: Keep container tightly sealed.
- Recommended storage temperature: Store at temperatures not exceeding -18 °C.
- 7.3 Specific end use(s) No further relevant information available.

GB
SECTION 8: Exposure controls/personal protection

- Additional information about design of technical facilities: No further data; see item 7.

8.1 Control parameters

- Ingredients with limit values that require monitoring at the workplace:

| 10210-68-1 octacarbonyldicobalt | WEL Long-term value: 0.1 mg/m³ as Co; Carc, Sen |

- Additional information: The lists valid during the making were used as basis.

8.2 Exposure controls

- Personal protective equipment:
  - General protective and hygienic measures:
    Keep away from foodstuffs, beverages and feed.
    Immediately remove all soiled and contaminated clothing.
    Wash hands before breaks and at the end of work.
    Store protective clothing separately.
  - Respiratory protection:
    In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use self-contained respiratory protective device.
  - Protection of hands:
    ![](Protective gloves)
    The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture. Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
  - Material of gloves
    The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
  - Penetration time of glove material
    The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.
  - Eye protection:
    ![](Tightly sealed goggles)

9.1 Information on basic physical and chemical properties

- General Information
  - Appearance:
    Form: Crystalline
    Colour: Dark orange colour
  - Odour: Acetone-like
  - Odour threshold: Not determined.
  - pH-value: Not applicable.

- Change in condition
  Melting point/Melting range: 51 °C
### Safety data sheet

**Trade name:** Cobalt carbonyl (Dicobalt octacarbonyl) (Stabilized with 1-5% hexanes)

<table>
<thead>
<tr>
<th>Boiling point/Boiling range:</th>
<th>Undetermined.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash point:</td>
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<tr>
<td>Flammability (solid, gaseous):</td>
<td>Flammable.</td>
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<tr>
<td>Ignition temperature:</td>
<td></td>
</tr>
<tr>
<td>Decomposition temperature:</td>
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</tr>
<tr>
<td>Self-igniting:</td>
<td>Product is not selfigniting.</td>
</tr>
<tr>
<td>Explosion limits:</td>
<td></td>
</tr>
<tr>
<td>Lower:</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Upper:</td>
<td>Not determined.</td>
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<tr>
<td>Vapour pressure at 20 °C:</td>
<td>1 hPa</td>
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<tr>
<td>Density at 20 °C:</td>
<td>1.73 g/cm³</td>
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<tr>
<td>Relative density</td>
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<tr>
<td>Vapour density</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Solubility in / Miscibility with water:</td>
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</tr>
<tr>
<td>Partition coefficient (n-octanol/water):</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Viscosity:</td>
<td></td>
</tr>
<tr>
<td>Dynamic:</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Kinematic:</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Solvent content:</td>
<td></td>
</tr>
<tr>
<td>Organic solvents:</td>
<td>0.0 %</td>
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<tr>
<td>VOC (EC)</td>
<td>0.00 %</td>
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<tr>
<td>Solids content:</td>
<td>100.0 %</td>
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<tr>
<td>9.2 Other information</td>
<td>No further relevant information available.</td>
</tr>
</tbody>
</table>

**SECTION 10: Stability and reactivity**

- **10.1 Reactivity** No further relevant information available.
- **10.2 Chemical stability**
- **Thermal decomposition / conditions to be avoided**: No decomposition if used according to specifications.
- **10.3 Possibility of hazardous reactions** No dangerous reactions known.
- **10.4 Conditions to avoid** No further relevant information available.
- **10.5 Incompatible materials**: No further relevant information available.
- **10.6 Hazardous decomposition products**: No dangerous decomposition products known.

**SECTION 11: Toxicological information**

- **11.1 Information on toxicological effects**
- **Acute toxicity** Harmful if swallowed or if inhaled.
Trade name: Cobalt carbonyl (Dicobalt octacarbonyl) (Stabilized with 1-5% hexanes)

- **LD/LC50 values relevant for classification:**
  - 10210-68-1 octacarbonyldicobalt
    - Oral LD50: 754 mg/kg (rat)
    - Inhalative LC50/4 h: 0.02 mg/l (mouse)

- **Primary irritant effect:**
  - Skin corrosion/irritation: Based on available data, the classification criteria are not met.
  - Serious eye damage/irritation: Based on available data, the classification criteria are not met.
  - Respiratory or skin sensitisation
    - May cause an allergic skin reaction.
  - CMR effects (carcinogenity, mutagenicity and toxicity for reproduction)
    - Germ cell mutagenicity: Based on available data, the classification criteria are not met.
    - Carcinogenicity: Suspected of causing cancer.
    - Reproductive toxicity: Based on available data, the classification criteria are not met.
  - STOT-single exposure: Based on available data, the classification criteria are not met.
  - STOT-repeated exposure: May cause damage to organs through prolonged or repeated exposure.
  - Aspiration hazard: Based on available data, the classification criteria are not met.

**SECTION 12: Ecological information**

- **12.1 Toxicity**
  - Aquatic toxicity: No further relevant information available.
- **12.2 Persistence and degradability** No further relevant information available.
- **12.3 Bioaccumulative potential** No further relevant information available.
- **12.4 Mobility in soil** No further relevant information available.
- **Additional ecological information:**
  - General notes: Not known to be hazardous to water.
- **12.5 Results of PBT and vPvB assessment**
  - PBT: Not applicable.
  - vPvB: Not applicable.
- **12.6 Other adverse effects** No further relevant information available.

**SECTION 13: Disposal considerations**

- **13.1 Waste treatment methods**
  - Recommendation
    - Must not be disposed together with household garbage. Do not allow product to reach sewage system.
  - Uncleaned packaging:
    - Recommendation: Disposal must be made according to official regulations.

**SECTION 14: Transport information**

- **14.1 UN-Number**
  - ADR, IMDG, IATA: UN3190
- **14.2 UN proper shipping name**
  - ADR: 3190 SELF-HEATING SOLID, INORGANIC, N.O.S.
  - IMDG: SELF-HEATING SOLID, INORGANIC, N.O.S.
### Trade name: Cobalt carbonyl (Dicobalt octacarbonyl) (Stabilized with 1-5% hexanes)

<table>
<thead>
<tr>
<th>IATA</th>
<th>Self-heating solid, inorganic, n.o.s.</th>
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</thead>
<tbody>
<tr>
<td><strong>14.3 Transport hazard class(es)</strong></td>
<td></td>
</tr>
<tr>
<td>ADR</td>
<td></td>
</tr>
<tr>
<td>· Class</td>
<td>4</td>
</tr>
<tr>
<td>· Label</td>
<td>4.2</td>
</tr>
<tr>
<td><strong>IMDG, IATA</strong></td>
<td></td>
</tr>
<tr>
<td>· Class</td>
<td>4.2 Substances liable to spontaneous combustion.</td>
</tr>
<tr>
<td>· Label</td>
<td>4.2</td>
</tr>
<tr>
<td><strong>14.4 Packing group</strong></td>
<td></td>
</tr>
<tr>
<td>ADR, IMDG, IATA</td>
<td>II</td>
</tr>
<tr>
<td><strong>14.5 Environmental hazards:</strong></td>
<td></td>
</tr>
<tr>
<td>· Marine pollutant:</td>
<td>No</td>
</tr>
<tr>
<td><strong>14.6 Special precautions for user</strong></td>
<td></td>
</tr>
<tr>
<td>· EMS Number:</td>
<td>F-A,S-J</td>
</tr>
<tr>
<td>· Stowage Category</td>
<td>E</td>
</tr>
<tr>
<td><strong>14.7 Transport in bulk according to Annex II of Marpol and the IBC Code</strong></td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>Transport/Additional information:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>ADR</strong></td>
<td></td>
</tr>
<tr>
<td>· Limited quantities (LQ)</td>
<td>0</td>
</tr>
<tr>
<td>· Exempted quantities (EQ)</td>
<td>Code: E2</td>
</tr>
<tr>
<td>Maximum net quantity per inner packaging: 30 g</td>
<td></td>
</tr>
<tr>
<td>Maximum net quantity per outer packaging: 500 g</td>
<td></td>
</tr>
<tr>
<td><strong>IMDG</strong></td>
<td></td>
</tr>
<tr>
<td>· Limited quantities (LQ)</td>
<td>0</td>
</tr>
<tr>
<td>· Exempted quantities (EQ)</td>
<td>Code: E2</td>
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<tr>
<td>Maximum net quantity per inner packaging: 30 g</td>
<td></td>
</tr>
<tr>
<td>Maximum net quantity per outer packaging: 500 g</td>
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<tr>
<td><strong>UN &quot;Model Regulation&quot;:</strong></td>
<td>UN 3190 SELF-HEATING SOLID, INORGANIC, N.O.S., 4.2, II</td>
</tr>
</tbody>
</table>

### SECTION 15: Regulatory information

- **15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**
  - Directive 2012/18/EU
  - Named dangerous substances - ANNEX I None of the ingredients is listed.
**SECT 16: Other information**

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- **Relevant phrases**
  - H225 Highly flammable liquid and vapour.
  - H228 Flammable solid.
  - H251 Self-heating: may catch fire.
  - H302 Harmful if swallowed.
  - H317 May cause an allergic skin reaction.
  - H330 Fatal if inhaled.
  - H351 Suspected of causing cancer.
  - H373 May cause damage to organs through prolonged or repeated exposure.

- **Department issuing MSDS:** Technical Department.
- **Contact:** Technical Director

- **Abbreviations and acronyms:**
  - ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
  - IMDG: International Maritime Code for Dangerous Goods
  - IATA: International Air Transport Association
  - GHS: Globally Harmonised System of Classification and Labelling of Chemicals
  - EINECS: European Inventory of Existing Commercial Chemical Substances
  - ELINCS: European List of Notified Chemical Substances
  - CAS: Chemical Abstracts Service (division of the American Chemical Society)
  - VOC: Volatile Organic Compounds (USA, EU)
  - LC50: Lethal concentration, 50 percent
  - LD50: Lethal dose, 50 percent
  - PBT: Persistent, Bioaccumulative and Toxic
  - vPvB: very Persistent and very Bioaccumulative
  - Flam. Liq. 2: Flammable liquids, Hazard Category 2
  - Flam. Sol. 1: Flammable solids, Hazard Category 1
  - Self-heat. 1: Self-Heating Substances and Mixtures, Hazard Category 1
  - Acute Tox. 4: Acute toxicity, Hazard Category 4
  - Acute Tox. 1: Acute toxicity, Hazard Category 1
  - Skin Sens. 1: Sensitisation - Skin, Hazard Category 1
  - Carc. 2: Carcinogenicity, Hazard Category 2
  - STOT RE 2: Specific target organ toxicity - Repeated exposure, Hazard Category 2