1 Identification

· Product name
  · Trade name: Cobalt tricarbonyl nitrosyl
  · Item number: 27-0500
  · CAS Number: 14096-82-3
  · EC number: 237-945-5

· Details of the supplier of the safety data sheet
  · Manufacturer/Supplier: Strem Chemicals, Inc.
    7 Mulliken Way
    NEWBURYPORT, MA 01950
    USA
    info@strem.com
  · Information department: Technical Department
  · Emergency telephone number:
    EMERGENCY: CHEMTREC: +1 (800) 424-9300
    During normal opening times: +1 (978) 499-1600

2 Hazard(s) identification

· Classification of the substance or mixture
  · GHS02 Flame
    Flam. Liq. 2 H225 Highly flammable liquid and vapor.
  · GHS06 Skull and crossbones
    Acute Tox. 3 H301 Toxic if swallowed.
    Acute Tox. 3 H311 Toxic in contact with skin.
    Acute Tox. 3 H331 Toxic if inhaled.
  · GHS08 Health hazard
    Carc. 2 H351 Suspected of causing cancer.

· Label elements
  · GHS label elements
    The substance is classified and labeled according to the Globally Harmonized System (GHS).
  · Hazard pictograms
    GHS02 GHS06 GHS08

· Signal word Danger
Trade name: Cobalt tricarbonyl nitrosyl

- **Hazard-determining components of labeling:**
  Cobalt tricarbonyl nitrosyl

- **Hazard statements**
  H225 Highly flammable liquid and vapor.
  H301+H311+H331 Toxic if swallowed, in contact with skin or if inhaled.
  H351 Suspected of causing cancer.

- **Precautionary statements**
  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.

- **Classification system:**
  - **NFPA ratings (scale 0 - 4)**
    Health = 2
    Fire = 3
    Reactivity = 0
  - **HMIS-ratings (scale 0 - 4)**
    HEALTH Health = 2
    FIRE Fire = 3
    REACTIVITY Reactivity = 0

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

3 Composition/information on ingredients

- **Chemical characterization:** Substances
  - CAS No. Description
    14096-82-3 Cobalt tricarbonyl nitrosyl
  - Identification number(s)
    - EC number: 237-945-5

4 First-aid measures

- **Description of first aid measures**
  - **General information:**
    Immediately remove any clothing soiled by the product.
    Remove breathing apparatus only after contaminated clothing have been completely removed.
    In case of irregular breathing or respiratory arrest provide artificial respiration.
  - **After inhalation:**
    Supply fresh air or oxygen; call for 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.
44.1.1
· After eye contact: Rinse opened eye for several minutes under running water. Then consult a doctor.
· After swallowing: Do not induce vomiting; immediately call for medical help.
· Information for doctor:
  · Most important symptoms and effects, both acute and delayed: No further relevant information available.
  · Indication of any immediate medical attention and special treatment needed: No further relevant information available.

5 Fire-fighting measures

· Extinguishing media
· Suitable extinguishing agents:
  CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
· For safety reasons unsuitable extinguishing agents: Water with full jet
· Special hazards arising from the substance or mixture: No further relevant information available.
· Advice for firefighters
  · Protective equipment: Mouth respiratory protective device.

6 Accidental release measures

· Personal precautions, protective equipment and emergency procedures
  Wear protective equipment. Keep unprotected persons away.
· Environmental precautions: Prevent seepage into sewage system, workpits and cellars.
· Methods and material for containment and cleaning up:
  Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
  Dispose contaminated material as waste according to item 13.
  Ensure adequate ventilation.
· 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.
· Protective Action Criteria for Chemicals
  · PAC-1:
    Substance is not listed.
  · PAC-2:
    Substance is not listed.
  · PAC-3:
    Substance is not listed.

7 Handling and storage

· Handling: Handle under inert gas.
· Precautions for safe handling
  Ensure good ventilation/exhaustion at the workplace.
  Open and handle receptacle with care.
  Prevent formation of aerosols.
· Information about protection against explosions and fires
  Keep ignition sources away - Do not smoke.
  Protect against electrostatic charges.
  Keep respiratory protective device available.
44.1.1 Conditions for safe storage, including any incompatibilities

· Storage:
  - Keep cool.
  - Store under inert gas.

· Requirements to be met by storerooms and receptacles:
  - Store in a cool location.

· Information about storage in one common storage facility:
  - Not required.

· Further information about storage conditions:
  - Keep receptacle tightly sealed.
  - Store in cool, dry conditions in well-sealed receptacles.

· Recommended storage temperature:
  - Store at temperatures not exceeding -18 °C. Keep cool.

· Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

· Additional information about design of technical systems: No further data; see item 7.

· Control parameters
  - Components with limit values that require monitoring at the workplace: Not required.

· Additional information: The lists that were valid during the creation were used as basis.

· 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.
      - Avoid contact with the eyes and skin.

· 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.

· 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 Physical and chemical properties

- **Information on basic physical and chemical properties**
  - **General Information**
  - **Appearance:**
    - Form: Liquid
    - Color: Dark red
  - **Odor:** Acrid
  - **Odor threshold:** Not determined.
  - **pH-value:** Not determined.

- **Change in condition**
  - **Melting point/Melting range:** Undetermined.
  - **Boiling point/Boiling range:** 50 °C (122 °F)

- **Flash point:** Not applicable.

- **Flammability (solid, gaseous):** Not determined.

- **Ignition temperature:**
  - **Decomposition temperature:** Not determined.
  - **Auto igniting:** Not determined.
  - **Danger of explosion:** Product is not explosive. However, formation of explosive air/vapor mixtures are possible.

- **Explosion limits:**
  - **Lower:** Not determined.
  - **Upper:** Not determined.

- **Vapor pressure:** Not determined.

- **Density at 20 °C (68 °F):** 1.47 g/cm³ (12.26715 lbs/gal)
  - **Relative density** Not determined.
  - **Vapor density** Not determined.
  - **Evaporation rate** Not determined.

- **Solubility in / Miscibility with Water:** Not miscible or difficult to mix.

- **Partition coefficient (n-octanol/water):** Not determined.

- **Viscosity:**
  - **Dynamic:** Not determined.
  - **Kinematic:** Not determined.

- **Solvent content:**
  - **Organic solvents:** 0.0 %
  - **VOC content:** 0.0 g/l / 0.00 lb/gl
  - **Other information** No further relevant information available.

### 10 Stability and reactivity

- **Reactivity** No further relevant information available.
- **Chemical stability**
- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
- **Possibility of hazardous reactions** No dangerous reactions known.
11 Toxicological information

- Information on toxicological effects
  - Acute toxicity:
    - Primary irritant effect:
      - on the skin: No irritant effect.
      - on the eye: No irritating effect.
      - Sensitization: No sensitizing effects known.
  - Additional toxicological information:

12 Ecological information

- Toxicity
  - Aquatic toxicity: No further relevant information available.
  - Persistence and degradability: No further relevant information available.
  - Behavior in environmental systems:
    - Bioaccumulative potential: No further relevant information available.
    - Mobility in soil: No further relevant information available.
  - Additional ecological information:
    - General notes: Not known to be hazardous to water.
    - Results of PBT and vPvB assessment
      - PBT: Not applicable.
      - vPvB: Not applicable.
    - Other adverse effects: No further relevant information available.

13 Disposal considerations

- Waste treatment methods
  - Recommendation: Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

- Uncleaned packagings
  - Recommendation: Disposal must be made according to official regulations.
### 14 Transport information

- **UN-Number**
  - DOT, IMDG, IATA: UN1992

- **UN proper shipping name**
  - DOT: Flammable liquids, toxic, n.o.s.
  - IMDG, IATA: FLAMMABLE LIQUID, TOXIC, N.O.S.

- **Transport hazard class(es)**
  - DOT
    - Class: 3 Flammable liquids
    - Label: 3, 6.1
  - IMDG
    - Class: 3 Flammable liquids
    - Label: 3/6.1
  - IATA
    - Class: 3 Flammable liquids
    - Label: 3 (6.1)

- **Packing group**
  - DOT, IMDG, IATA: II

- **Environmental hazards:**
  - Marine pollutant: No

- **Special precautions for user**
  - EMS Number: F-E-S-D
  - Stowage Category: B
  - Stowage Code: SW2 Clear of living quarters.

- **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**
  - Not applicable.

- **Transport/Additional information:**
  - DOT
    - Quantity limitations:
      - On passenger aircraft/rail: 5 L
      - On cargo aircraft only: 60 L
Safety Data Sheet
according to OSHA HCS

Trade name: Cobalt tricarbonyl nitrosyl

- IMDG
  - Limited quantities (LQ)  IL
  - Excepted quantities (EQ)  Code: E2
    Maximum net quantity per inner packaging: 30 ml
    Maximum net quantity per outer packaging: 500 ml
- UN "Model Regulation":  UN 1992 FLAMMABLE LIQUIDS, TOXIC, N.O.S., 3 (6.1), II

15 Regulatory information

- Safety, health and environmental regulations/legislation specific for the substance or mixture
  - Sara
- Section 355 (extremely hazardous substances):
  Substance is not listed.
- Section 313 (Specific toxic chemical listings):
  Substance is listed.
- TSCA (Toxic Substances Control Act):
  Substance is not listed.
- Proposition 65
- Chemicals known to cause cancer:
  Substance is not listed.
- Chemicals known to cause reproductive toxicity for females:
  Substance is not listed.
- Chemicals known to cause reproductive toxicity for males:
  Substance is not listed.
- Chemicals known to cause developmental toxicity:
  Substance is not listed.
- Carcinogenic categories
  - EPA (Environmental Protection Agency)
    Substance is not listed.
  - TLV (Threshold Limit Value established by ACGIH)
    Substance is not listed.
  - NIOSH-Ca (National Institute for Occupational Safety and Health)
    Substance is not listed.
- GHS label elements
  The substance is classified and labeled according to the Globally Harmonized System (GHS).
- Hazard pictograms
  - GHS02  GHS06  GHS08
- Signal word Danger
- Hazard-determining components of labeling:
  Cobalt tricarbonyl nitrosyl
### 44.1.1 Hazard statements
- **H225** Highly flammable liquid and vapor.
- **H301+H311+H331** Toxic if swallowed, in contact with skin or if inhaled.
- **H351** Suspected of causing cancer.

### 44.1.2 Precautionary statements
- **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.

### 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.

- **Department issuing SDS:** Technical Department.
- **Contact:** Technical Director
- **Date of preparation / last revision** 07/17/2021
- **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
  - **DOT:** US Department of Transportation
  - **IATA:** International Air Transport Association
  - **ACGIH:** American Conference of Governmental Industrial Hygienists
  - **EINECS:** European Inventory of Existing Commercial Chemical Substances
  - **CAS:** Chemical Abstracts Service (division of the American Chemical Society)
  - **NFPA:** National Fire Protection Association (USA)
  - **HMIS:** Hazardous Materials Identification System (USA)
  - **VOC:** Volatile Organic Compounds (USA, EU)
  - **PBT:** Persistent, Bioaccumulative and Toxic
  - **vPvB:** very Persistent and very Bioaccumulative
  - **NIOSH:** National Institute for Occupational Safety
  - **OSHA:** Occupational Safety & Health
  - **TLV:** Threshold Limit Value
  - **PEL:** Permissible Exposure Limit
  - **REL:** Recommended Exposure Limit
  - **Flam. Liq. 2:** Flammable liquids – Category 2
  - **Acute Tox. 3:** Acute toxicity – Category 3
  - **Carc. 2:** Carcinogenicity – Category 2