1 Identification

- Product name
- Trade name: Bis(cyclopentadienyl)nickel, 99% (Nickelocene)
- Item number: 28-1301
- CAS Number: 1271-28-9
- EC number: 215-039-0

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. Sol. 1 H228 Flammable solid.

  - GHS06 Skull and crossbones
    Acute Tox. 3 H301 Toxic if swallowed.

  - GHS08 Health hazard
    Resp. Sens. 1 H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
    Carc. 1A H350 May cause cancer.

  - GHS07
    Acute Tox. 4 H332 Harmful if inhaled.
    Skin Irrit. 2 H315 Causes skin irritation.
    Eye Irrit. 2A H319 Causes serious eye irritation.
    Skin Sens. 1 H317 May cause an allergic skin reaction.
    STOT SE 3 H335 May cause respiratory irritation.

- Label elements
- GHS label elements
  The substance is classified and labeled according to the Globally Harmonized System (GHS).
Trade name: Bis(cyclopentadienyl)nickel, 99% (Nickelocene)

· **Hazard pictograms**

[ ![GHS02](image1.png) ![GHS06](image2.png) ![GHS07](image3.png) ![GHS08](image4.png) ]

· **Signal word** Danger

· **Hazard-determining components of labeling:**
  Nickelocene

· **Hazard statements**
  H228 Flammable solid.
  H301 Toxic if swallowed.
  H322 Harmful if inhaled.
  H315 Causes skin irritation.
  H319 Causes serious eye irritation.
  H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
  H317 May cause an allergic skin reaction.
  H350 May cause cancer.
  H335 May cause respiratory irritation.

· **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.
  P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

· **Classification system:**

· **NFPA ratings (scale 0 - 4)**

  ![Rating](rating.png)
  Health = 3
  Fire = 2
  Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**

  ![Rating](rating.png)
  Health = *2
  Fire = 0
  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**

  1271-28-9 Nickelocene
Trade name: Bis(cyclopentadienyl)nickel, 99% (Nickelocene)

· Identification number(s)
· EC number: 215-039-0

4 First-aid measures

· 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.
  In case of irregular breathing or respiratory arrest provide artificial respiration.
· 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. If symptoms persist, 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.
· 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: No special measures required.
· Methods and material for containment and cleaning up:
  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.

7 Handling and storage

· Handling: Handle under inert gas.
· Precautions for safe handling
  Thorough dedusting.
Trade name: Bis(cyclopentadienyl)nickel, 99% (Nickelocene)

Ensure good ventilation/exhaustion at the workplace.
Open and handle receptacle with care.

- **Information about protection against explosions and fires:**
  - Keep ignition sources away - Do not smoke.
  - Protect against electrostatic charges.
  - Keep respiratory protective device available.

- **Conditions for safe storage, including any incompatibilities**
  - **Storage:** 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 receptacle tightly sealed.

- **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:**

<table>
<thead>
<tr>
<th>Component</th>
<th>PEL (Long-term value)</th>
<th>REL (Long-term value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1271-28-9 Nickelocene</td>
<td>1 mg/m³ as Ni</td>
<td>0.015 mg/m³ as Ni; See Pocket Guide App. A</td>
</tr>
</tbody>
</table>

- **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.

- **Breathing equipment:**
  - In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

- **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.
### Physical and chemical properties

**Information on basic physical and chemical properties**

**General Information**

- **Appearance:**
  - **Form:** Crystalline
  - **Color:** Dark green
  - **Odor:** Odorless
  - **Odor threshold:** Not determined.

- **pH-value:** Not applicable.

- **Change in condition**
  - **Melting point/Melting range:** 173-174 °C (343-345 °F)
  - **Boiling point/Boiling range:** no data °C

- **Flash point:** Not applicable.

- **Flammability (solid, gaseous):** Flammable.

- **Ignition temperature:**
  - **Decomposition temperature:** Not determined.
  - **Auto igniting:** Not determined.
  - **Danger of explosion:** Not determined.

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

- **Vapor pressure:** no data hPa

- **Density:** Not determined.
  - **Relative density:** Not determined.
  - **Vapor density:** Not applicable.
  - **Evaporation rate:** Not applicable.

- **Solubility in / Miscibility with Water:** Insoluble.

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

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

- **Solvent content:**
  - **Organic solvents:** 0.0 %
  - **VOC content:** 0.0 g/l / 0.00 lb/gl
  - **Solids content:** 100.0 %
Trade name: Bis(cyclopentadienyl)nickel, 99% (Nickelocene)

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.
- Conditions to avoid: No further relevant information available.
- Incompatible materials: No further relevant information available.
- Hazardous decomposition products: No dangerous decomposition products known.

11 Toxicological information

- Information on toxicological effects
- Acute toxicity:
- Primary irritant effect:
  - on the skin: Irritant to skin and mucous membranes.
  - on the eye: Irritating effect.
- Sensitization:
  Sensitization possible through inhalation.
  Sensitization possible through skin contact.
- Additional toxicological information:
- Carcinogenic categories
  - IARC (International Agency for Research on Cancer)
    1271-28-9 Nickelocene 1
  - NTP (National Toxicology Program)
    1271-28-9 Nickelocene K
  - OSHA-Ca (Occupational Safety & Health Administration)
    Substance is not listed.

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
    UN1325

- UN proper shipping name
  - DOT, IATA
    Flammable solids, organic, n.o.s.
  - IMDG
    FLAMMABLE SOLID, ORGANIC, N.O.S.

- Transport hazard class(es)
  - DOT
    - Class 4.1 Flammable solids, self-reactive substances and solid desensitised explosives
    - Label 4.1
  - IMDG
    - Class 4
    - Label 4.1
  - IATA
    - Class 4.1 Flammable solids, self-reactive substances and solid desensitised explosives
    - Label 4.1

- Packing group
  - DOT, IMDG, IATA
    II

- Environmental hazards:
  - Marine pollutant: No

- Special precautions for user
  - Not applicable.

- EMS Number: F-A,S-G
Trade name: Bis(cyclopentadienyl)nickel, 99% (Nickelocene)

<table>
<thead>
<tr>
<th>Stowage Category</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Transport/Additional information:</td>
<td></td>
</tr>
<tr>
<td>DOT</td>
<td></td>
</tr>
<tr>
<td>Quantity limitations</td>
<td>On passenger aircraft/rail: 15 kg On cargo aircraft only: 50 kg</td>
</tr>
<tr>
<td>UN &quot;Model Regulation&quot;:</td>
<td>UN 1325 FLAMMABLE SOLIDS, ORGANIC, N.O.S., 4.1, II</td>
</tr>
</tbody>
</table>

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 listed.
  - Proposition 65
    - Chemicals known to cause cancer:
      Substance is 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
    - GHS07
    - GHS08
Trade name: Bis(cyclopentadienyl)nickel, 99% (Nickelocene)

- **Signal word** Danger

- **Hazard-determining components of labeling:**
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  H228 Flammable solid.
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  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.
  P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

- **National regulations:**
  - **Additional classification according to Decree on Hazardous Materials:**
    Carcinogenic hazardous material group I (extremely dangerous).
    Carcinogenic hazardous material group II (very dangerous).
    Carcinogenic hazardous material group III (dangerous).

- **Information about limitation of use:**
  Workers are not allowed to be exposed to this hazardous material. Exceptions can be made by the authorities in certain cases.

- **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

### 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** 07/30/2016 / -
- **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

(Condt. on page 10)
**Trade name: Bis(cyclopentadienyl)nickel, 99% (Nickelocene)**

TLV: Threshold Limit Value  
PEL: Permissible Exposure Limit  
REL: Recommended Exposure Limit  
Flam. Sol. 1: Flammable solids, Hazard Category 1  
Acute Tox. 3: Acute toxicity, Hazard Category 3  
Acute Tox. 4: Acute toxicity, Hazard Category 4  
Skin Irrit. 2: Skin corrosion/irritation, Hazard Category 2  
Eye Irrit. 2A: Serious eye damage/eye irritation, Hazard Category 2A  
Resp. Sens. 1: Sensitisation - Respirat., Hazard Category 1  
Skin Sens. 1: Sensitisation - Skin, Hazard Category 1  
Carc. 1A: Carcinogenicity, Hazard Category 1A  
STOT SE 3: Specific target organ toxicity - Single exposure, Hazard Category 3