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

1.1 Product identifier
- Trade name: (+)-N,N’-(1S,2S)-1,2-Diaminocyclohexanediylbis(2-pyridinecarboxamide), min. 98% (S,S)-DACH-Pyridyl Trost Ligand
- Item number: 07-0341
- CAS Number: 172138-95-3

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
  The substance is not classified according to the CLP regulation.

2.2 Label elements
- Labelling according to Regulation (EC) No 1272/2008 Void
- Hazard pictograms Void
- Signal word Void
- Hazard statements Void
- Precautionary statements
  P262 Do not get in eyes, on skin, or on clothing.
  P280 Wear protective gloves/protective clothing/eye protection/face protection.
  P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
  P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
  P403+P233 Store in a well-ventilated place. Keep container tightly closed.
  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

- 3.1 Chemical characterisation: Substances
- CAS No. Description
  172138-95-3 (+)-N,N'-(1S,2S)-1,2-Diaminocyclohexanediylbis(2-pyridinecarboxamide), min. 98% (S,S)-DACH-Pyridyl Trost Ligand

SECTION 4: First aid measures

- 4.1 Description of first aid measures
  - General information: No special measures required.
  - After inhalation: Supply fresh air; consult doctor in case of complaints.
  - After skin contact: Immediately rinse with water.
  - After eye contact: Rinse opened eye for several minutes under running water. Then consult a doctor.
  - After swallowing: If symptoms persist consult doctor.
- 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: Use fire extinguishing methods suitable to surrounding conditions.
- 5.2 Special hazards arising from the substance or mixture No further relevant information available.
- 5.3 Advice for firefighters
  - Protective equipment: No special measures required.

SECTION 6: Accidental release measures

- 6.1 Personal precautions, protective equipment and emergency procedures Not required.
- 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.
- 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 No special measures required.
- Information about fire - and explosion protection: No special measures required.
- 7.2 Conditions for safe storage, including any incompatibilities
  - Storage:
    - 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: None.
7.3 Specific end use(s) No further relevant information available.

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: Not required.
- Additional information: The lists valid during the making were used as basis.

8.2 Exposure controls
- Personal protective equipment:
  - General protective and hygienic measures:
    The usual precautionary measures are to be adhered to when handling chemicals.
  - Respiratory protection: Not required.
  - 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: Safety glasses

9.1 Information on basic physical and chemical properties
- General Information
  - Appearance:
    Form: Powder
    Colour: Whitish
  - Odour: Undistinguishable.
  - Odour threshold: Not determined.
- pH-value: Not applicable.
- Change in condition
  - Melting point/freezing point: 170 °C
  - Initial boiling point and boiling range: Undetermined.
  - Flash point: Not applicable.
- Flammability (solid, gas): Product is not flammable.
- Ignition temperature:
  - Decomposition temperature: Not determined.
  - Auto-ignition temperature: Not determined.
- Explosive properties: Product does not present an explosion hazard.
Trade name: (+)-N,N'-(1S,2S)-1,2-Diaminocyclohexanediylbis(2-pyridinecarboxamide), min. 98% (S,S)-DACH-Pyridyl Trost Ligand

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

- **Vapour pressure:** Not applicable.

- **Density:**
  - Not determined.
  - Relative density: Not determined.
  - Vapour 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 (EC): 0.00 %

- **Solids content:** 100.0 %

- **9.2 Other information**
  - No further relevant information available.

### SECTION 10: Stability and reactivity

- **10.1 Reactivity**
  - No further relevant information available.

- **10.2 Chemical stability**
  - 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**
    - Based on available data, the classification criteria are not met.
  - **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
      - Based on available data, the classification criteria are not met.
  - **CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction)**
    - Germ cell mutagenicity
      - Based on available data, the classification criteria are not met.
    - Carcinogenicity
      - Based on available data, the classification criteria are not met.
    - 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**
    - Based on available data, the classification criteria are not met.
**Trade name:** (+)-N,N'-(1S,2S)-1,2-Diaminocyclohexanediylbis(2-pyridinecarboxamide), min. 98% (S,S)-DACH-Pyridyl Trost Ligand

- **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**: Disposal must be made according to official regulations.
- **Uncleaned packaging**:
  - **Recommendation**: Disposal must be made according to official regulations.

### SECTION 14: Transport information

- **14.1 UN-Number**
  - **ADR, ADN, IMDG, IATA**: not regulated
- **14.2 UN proper shipping name**
  - **ADR, ADN, IMDG, IATA**: not regulated
- **14.3 Transport hazard class(es)**
  - **ADR, ADN, IMDG, IATA**: not regulated
- **14.4 Packing group**
  - **ADR, IMDG, IATA**: not regulated
- **14.5 Environmental hazards**:
  - **Marine pollutant**: No
- **14.6 Special precautions for user**: Not applicable.
- **14.7 Transport in bulk according to Annex II of Marpol and the IBC Code**: Not applicable.
- **UN "Model Regulation"**: not regulated
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 Substance is not listed.
  · 15.2 Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

SECTION 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
· 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
  CAS: Chemical Abstracts Service (division of the American Chemical Society)
  VOC: Volatile Organic Compounds (USA, EU)
  PBT: Persistent, Bioaccumulative and Toxic
  vPvB: very Persistent and very Bioaccumulative