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

1.1 Product identifier
- Trade name: 2,2,6,6-Tetramethylpiperidinylmagnesium chloride, lithium chloride complex 1.0M (18wt% ±2wt%) in toluene/tetrahydrofuran

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
- Flam. Liq. 2 H225 Highly flammable liquid and vapour.
- Water-react. 1 H260 In contact with water releases flammable gases which may ignite spontaneously.

GHS08 health hazard
- Carc. 2 H351 Suspected of causing cancer.
- Repr. 2 H361d Suspected of damaging the unborn child.
- STOT RE 2 H373 May cause damage to organs through prolonged or repeated exposure.
- Asp. Tox. 1 H304 May be fatal if swallowed and enters airways.

GHS07
- Skin Irrit. 2 H315 Causes skin irritation.
- Eye Irrit. 2 H319 Causes serious eye irritation.
- STOT SE 3 H335 May cause respiratory irritation.

2.2 Label elements
- Labelling according to Regulation (EC) No 1272/2008
  The product is classified and labelled according to the CLP regulation.
Safety data sheet  
according to 1907/2006/EC, Article 31

Trade name: 2,2,6,6-Tetramethylpiperidinylmagnesium chloride, lithium chloride complex 1.0M (18wt% ±2wt%) in toluene/tetrahydrofuran

Hazard pictograms

- GHS02
- GHS07
- GHS08

Signal word Danger

Hazard-determining components of labelling:
- Tetrahydrofuran [109-99-9]
- Toluene

Hazard statements
- H225 Highly flammable liquid and vapour.
- H260 In contact with water releases flammable gases which may ignite spontaneously.
- H315 Causes skin irritation.
- H319 Causes serious eye irritation.
- H351 Suspected of causing cancer.
- H361d Suspected of damaging the unborn child.
- H335 May cause respiratory irritation.
- H373 May cause damage to organs through prolonged or repeated exposure.
- H304 May be fatal if swallowed and enters airways.

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+P232 Handle under inert gas. Protect from moisture.
- P303+P351+P338 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
- P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P403+P233 Store in a well-ventilated place. Keep container tightly closed.
- P422 Store contents under inert gas.
- P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

Additional information:
- EUH019 May form explosive peroxides.

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:

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>EINECS: 203-726-8</td>
<td>Flam. Liq. 2, H225; Carc. 2, H331; Eye Irrit. 2, H319; STOT SE 3, H335</td>
</tr>
<tr>
<td>70.0%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CAS: 108-88-3</th>
<th>Toluene</th>
</tr>
</thead>
<tbody>
<tr>
<td>EINECS: 203-625-9</td>
<td>Flam. Liq. 2, H225; Repr. 2, H361d; STOT RE 2, H373; Asp. Tox. 1, H304; Skin Irrit. 2, H315; STOT SE 3, H336</td>
</tr>
<tr>
<td>12.0%</td>
<td></td>
</tr>
</tbody>
</table>

(Contd. on page 3)
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: 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: 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:
Sand. Do not use water.
CO2, sand, extinguishing powder. Do not use water.
For safety reasons unsuitable extinguishing agents: Water with full jet
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
Wear protective equipment. Keep unprotected persons away.
6.2 Environmental precautions: Prevent seepage into sewage system, workpits and cellars.
6.3 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.
Do not flush with water or aqueous cleansing agents
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 Open and handle receptacle with care.
Handling: Handle under inert gas.
42.0

· Information about fire - and explosion protection:
  Keep ignition sources away - Do not smoke.
  Protect against electrostatic charges.

· 7.2 Conditions for safe storage, including any incompatibilities
  · Storage: Store contents 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 container tightly sealed.
    Store in cool, dry conditions in well sealed receptacles.

· 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:

<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>WEL Short-term value: 300 mg/m³, 100 ppm</td>
</tr>
<tr>
<td>Long-term value: 150 mg/m³, 50 ppm</td>
</tr>
<tr>
<td>Sk</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>108-88-3 toluene</th>
</tr>
</thead>
<tbody>
<tr>
<td>WEL Short-term value: 384 mg/m³, 100 ppm</td>
</tr>
<tr>
<td>Long-term value: 191 mg/m³, 50 ppm</td>
</tr>
<tr>
<td>Sk</td>
</tr>
</tbody>
</table>

· 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.
    Avoid contact with the eyes and skin.
  · 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

(Contd. on page 5)
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 cannot 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

<table>
<thead>
<tr>
<th>9.1 Information on basic physical and chemical properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Information</td>
</tr>
<tr>
<td>Appearance:</td>
</tr>
<tr>
<td>Form: Liquid</td>
</tr>
<tr>
<td>Colour: Brown</td>
</tr>
<tr>
<td>Odour: Ether-like</td>
</tr>
<tr>
<td>Odour threshold: Not determined.</td>
</tr>
<tr>
<td>pH-value: Not determined</td>
</tr>
<tr>
<td>Change in condition</td>
</tr>
<tr>
<td>Melting point/Melting range: Undetermined.</td>
</tr>
<tr>
<td>Boiling point/Boiling range: Undetermined.</td>
</tr>
<tr>
<td>Flash point: Not applicable.</td>
</tr>
<tr>
<td>Flammability (solid, gaseous): Not determined.</td>
</tr>
<tr>
<td>Ignition temperature: 230 °C</td>
</tr>
<tr>
<td>Decomposition temperature: Not determined.</td>
</tr>
<tr>
<td>Self-igniting: Product is not selfigniting.</td>
</tr>
<tr>
<td>Danger of explosion: Explosive when dry. May form explosive peroxides.</td>
</tr>
<tr>
<td>Explosion limits:</td>
</tr>
<tr>
<td>Lower: 1.2 Vol %</td>
</tr>
<tr>
<td>Upper: 12.0 Vol %</td>
</tr>
<tr>
<td>Vapour pressure at 20 °C: 200 hPa</td>
</tr>
<tr>
<td>Density:</td>
</tr>
<tr>
<td>Relative density: Not determined.</td>
</tr>
<tr>
<td>Vapour density: Not determined.</td>
</tr>
<tr>
<td>Evaporation rate: Not determined.</td>
</tr>
<tr>
<td>Solubility in / Miscibility with water: Not miscible or difficult to mix.</td>
</tr>
<tr>
<td>Partition coefficient (n-octanol/water): Not determined.</td>
</tr>
<tr>
<td>Viscosity:</td>
</tr>
<tr>
<td>Dynamic: Not determined.</td>
</tr>
<tr>
<td>Kinematic: Not determined.</td>
</tr>
</tbody>
</table>
Solvent content:
- Organic solvents: 82.0 %
- VOC (EC): 82.00 %
- 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
- 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: Based on available data, the classification criteria are not met.
- LD/LC50 values relevant for classification:

<table>
<thead>
<tr>
<th></th>
<th>Oral</th>
<th>Dermal</th>
<th>Inhalative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetrahydrofuran [109-99-9]</td>
<td>LD50</td>
<td>LD50</td>
<td>LC50/4 h</td>
</tr>
<tr>
<td>Oral</td>
<td>2500 mg/kg (rat)</td>
<td>5000 mg/kg (rat)</td>
<td>5320 mg/l (mouse)</td>
</tr>
<tr>
<td>108-88-3 toluene</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dermal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inhalative</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Primary irritant effect:
- Skin corrosion/irritation: Causes skin irritation.
- Serious eye damage/irritation: Causes serious eye irritation.
- 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: Suspected of causing cancer.
- Reproductive toxicity: Suspected of damaging the unborn child.
- STOT-single exposure: May cause respiratory irritation.
- STOT-repeated exposure: May cause damage to organs through prolonged or repeated exposure.
- Aspiration hazard: May be fatal if swallowed and enters airways.
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 UN3399
· 14.2 UN proper shipping name
  · ADR
    3399 ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE, FLAMMABLE
  · IMDG
    ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE, FLAMMABLE
  · IATA
    Organometallic substance, liquid, water-reactive, flammable
· 14.3 Transport hazard class(es)
  · ADR
    4.3 Substances which, in contact with water, emit flammable gases.
    4.3+3
### IMDG

- **Class**: 4.3 Substances which, in contact with water, emit flammable gases.
- **Label**: 4.3/3

### IATA

- **Class**: 4.3 Substances which, in contact with water, emit flammable gases.
- **Label**: 4.3 (3)

### 14.4 Packing group

- **ADR, IMDG, IATA**: I

### 14.5 Environmental hazards:

- **Marine pollutant**: No

### 14.6 Special precautions for user

- **EMS Number**: F-G,S-M
- **Stowage Category**: D
- **Handling Code**: H1 Keep as dry as reasonably practicable
- **Segregation Code**: SG26 In addition: from goods of classes 2.1 and 3 when stowed on deck of a containership a minimum distance of two container spaces athwartship shall be maintained, when stowed on ro-ro ships a distance of 6 m athwartship shall be maintained. SG33 Stow "separated from" acids.

### 14.7 Transport in bulk according to Annex II of Marpol and the IBC Code

- **Transport/Additional information:** Not applicable.

### ADR

- **Limited quantities (LQ)**: 0
- **Excepted quantities (EQ) Code**: E0
  - Not permitted as Excepted Quantity

### UN "Model Regulation" :

- **UN 3399**: ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE, FLAMMABLE, 4.3 (3), I
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.
· Seveso category
  O2 Substances and mixtures which in contact with water emit flammable gases
  P5c FLAMMABLE LIQUIDS
· Qualifying quantity (tonnes) for the application of lower-tier requirements 100 t
· Qualifying quantity (tonnes) for the application of upper-tier requirements 500 t
· 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.

· Relevant phrases
  H225 Highly flammable liquid and vapour.
  H304 May be fatal if swallowed and enters airways.
  H315 Causes skin irritation.
  H319 Causes serious eye irritation.
  H335 May cause respiratory irritation.
  H336 May cause drowsiness or dizziness.
  H351 Suspected of causing cancer.
  H361d Suspected of damaging the unborn child.
  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
  Water-react. 1: Substances and Mixtures which, in contact with water, emit flammable gases, Hazard Category 1
  Skin Irrit. 2: Skin corrosion/irritation, Hazard Category 2
  Eye Irrit. 2: Serious eye damage/eye irritation, Hazard Category 2
  Carc. 2: Carcinogenicity, Hazard Category 2
  Repr. 2: Reproductive toxicity, Hazard Category 2
  STOT SE 3: Specific target organ toxicity - Single exposure, Hazard Category 3
  STOT RE 2: Specific target organ toxicity - Repeated exposure, Hazard Category 2
  Asp. Tox. 1: Aspiration hazard, Hazard Category 1