1. Identification of the Substance/Mixture and of the Company/Undertaking:

1.1 **Product Identifier:** Lithium Methoxide In Methanol

1.1.1 **Substances**

| Substances | Not applicable |

1.1.2 **Mixture name:** Lithium Methoxide In Methanol

1.2 **Relevant Identified Uses of the Substance or Mixture and Uses Advised Against:**

- Industrial Manufacturing
- Only to be supplied for industrial uses
- For use only as a chemical intermediate under Strictly Controlled Conditions

1.3 **Details of the Supplier of the Safety Data Sheet**

<table>
<thead>
<tr>
<th>Region</th>
<th>Address</th>
<th>Phone</th>
<th>Fax</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td>FMC Lithium USA Corp. 2801 Yorkmont Road, Suite 300 Charlotte, NC 28208 Phone: +1.704.426.5300 Fax: +1.704.426.5370 1.888.lithium</td>
<td>+1.800.424.9300 +1.703.527.3887</td>
<td>+1.704.629.5361</td>
</tr>
<tr>
<td>Europe</td>
<td>FMC Chemicals Limited Commercial Road Bromborough, Merseyside CH62 3NL, England Phone: +44.151. 334.8085 Fax: +44.151.482.7361</td>
<td>+44 870 8200418</td>
<td>+44.151.482.7361</td>
</tr>
<tr>
<td>Asia Pacific</td>
<td>FMC Specialty Chemicals (Zhangjiagang) Co. Ltd. 32 Beijing Road, Yangtse River Chemical Park, Zhangjiagang Free Trade Zone, Jiangsu 215635, China T: +86.512.5832.7307 Fax: +86.512.5832.7311</td>
<td>Phone: +86.512.5832.7307</td>
<td></td>
</tr>
</tbody>
</table>

email: lithium.info@fmc.com
Web: www.livent.com

1.4 **Emergency Telephone Number:**

<table>
<thead>
<tr>
<th>Region</th>
<th>CHEMTREC:</th>
<th>24 hr Specialist advice number:</th>
<th>CHEMTREC:</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td>+1.800.424.9300</td>
<td>+1.703.527.3887</td>
<td>+44.870 8200418</td>
</tr>
<tr>
<td>Plant:</td>
<td>+1.704.629.5361</td>
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<td></td>
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<tr>
<td>Europe</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Asia Pacific</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Hazards Identification

2.1 **Classification of the Mixture:**

2.1.1 **GHS Classification** [EC Regulation No 1272/2008 and US OSHA regulations]

- Skin corrosive; Category 1B
- Eye damage; Category 1
- Flammable liquid; Category 2
- Acute Toxicity; Category 3 (inhalation)
- Acute Toxicity; Category 3 (skin contact)
- Acute Toxicity; Category 3 (ingestion)
- Specific target organ systemic toxicity – SE Category 1

2.2.2 **EC: Classification according to 67/548/EEC or 1999/45/EC [DSD/DPD]**

F, R11 C, R34; T, R23/24/25, R39/23/24/25

2.2 **Label Elements:**

2.2.3 **Hazard Pictograms:**

![Hazard Pictograms]
2.2.4 Signal Word: Danger

Hazard Statement(s): Highly flammable liquid and vapour. Causes severe skin burns and eye damage. Toxic if swallowed, in contact with skin or if inhaled.

Causes damage to organs

Precautionary Statement(s):
Keep away from heat/sparks/open flames/hot surfaces. – No smoking. Wear protective glasses/protective clothing/eye protection/face protection. IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Remove / Take off immediately all contaminated clothing. Rinse skin with water / shower. If INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON Center or doctor/physician. In case of fire: Use dry chemical for extinction.

Additional Precautionary Statement(s):
Keep container tightly closed. Ground/bond container and receiving equipment. Use explosion-proof electrical/ventilating/lighting/equipment. Use only non-sparkling tools. Take precautionary measures against static discharge. Do not breathe dust/fume/gas/mist/vapours/spray. Wash hands thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. If skin irritation or rash occurs: Get medical advice/attention. Wash contaminated clothing before reuse. Store in a well-ventilated place. Keep cool. Dispose of contents/container to an approved waste disposal plant.

2.3 Other Hazards
None

3. Composition / Information on Ingredients

3.1 Substances
Not applicable.

3.2 Mixtures

3.1.1 GHS Classification [EC: Regulation No 1272/2008; US: OSHA regulations]

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS #</th>
<th>EC No</th>
<th>EC Index No</th>
<th>REACH Reg No</th>
<th>Wt.%</th>
<th>Classification, Hazard Statement Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lithium methoxide</td>
<td>865-34-9</td>
<td>212-737-7</td>
<td>None</td>
<td>None</td>
<td>1-15</td>
<td>Self-heat 1; H251</td>
</tr>
<tr>
<td>Methanol</td>
<td>67-56-1</td>
<td>200-659-6</td>
<td>603-001-00-X</td>
<td>Not available</td>
<td>85-99</td>
<td>Skin Corr. 1B; H314; Flam. Liq. 2; H225; Acute tox 3 (oral); H301; Acute tox 3 (dermal); H311; Acute tox 3 (inhal.); H331; STOT SE; H370</td>
</tr>
</tbody>
</table>

3.1.2 EC: Classification according to 67/548/EEC or 1999/45/EC [DSD/DPD]

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS #</th>
<th>EC No</th>
<th>Wt.%</th>
<th>Symbols</th>
<th>R-phrases</th>
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<tbody>
<tr>
<td>Lithium methoxide</td>
<td>865-34-9</td>
<td>212-737-7</td>
<td>1-15</td>
<td>C</td>
<td>R34</td>
</tr>
<tr>
<td>Methanol</td>
<td>67-56-1</td>
<td>200-659-6</td>
<td>85-99</td>
<td>F; R11; T;</td>
<td>R11</td>
</tr>
</tbody>
</table>

(See Section 16 for R-phrase text)
4. First Aid Measures

4.1 Description of First Aid Measures

**EYES:** Immediately flush with water for at least 15 minutes, lifting the upper and lower eyelids intermittently. See a medical doctor or ophthalmologist immediately.

**SKIN:** Immediately flush with plenty of water while removing contaminated clothing and/or shoes, and thoroughly wash with soap and water. Obtain immediate medical attention. Contact a medical doctor if necessary.

**INGESTION:** Quickly wipe material from the mouth and rinse mouth with water. Do not induce vomiting. Never give anything by mouth to an unconscious person. See a medical doctor immediately.

**INHALATION:** Remove to fresh air. If breathing discomfort occurs and persists, see a medical doctor. If breathing has stopped, give artificial respiration and see a medical doctor immediately.

4.2 Most Important Symptoms and effects, both acute and delayed

Symptoms of over-exposure will typically be a result of the corrosive nature of the substance with discomfort to skin and if swallowed, local effects with discomfort to the mouth and GI tract. Inhalation of solvent vapours may lead to dizziness and impairment of normal functions.

4.3 Indication of any immediate medical attention and special treatment needed.

**Notes to medical doctor:**
Product is highly alkaline and is corrosive to the eyes, skin and mucous membranes. Consideration should be given to careful endoscopy as stomach or esophageal burns, perforations or strictures may occur. Careful gastric lavage with an endotracheal tube in place should be considered. Observation may be warranted. Treatment is controlled removal of exposure followed by symptomatic and supportive care.

5. Fire-Fighting Measures

5.1 Extinguishing media

DO NOT USE WATER OR CARBON DIOXIDE. Use dry chemical.

5.2 Special hazards arising from the substance or mixture

**Hazardous combustion products**
Lithium hydroxide, formaldehyde, carbon dioxide, carbon monoxide.

**General Hazard**
Flammable liquid. Reacts violently with water to give off flammable fumes and corrosive dust.

**Properties contributing to Flammability**
Water reactivity of product, and volatility of solvents.

**Flashpoint**
Estimated: 12ºC, Closed Cup (methanol)

**Flammable limits in air**
Not available. For methanol (approximate): Upper: 36% Lower: 6%

**Auto ignition temperature**
Not available for formulation. Reported values for methanol vary: 385 ºC, also 464-470 ºC

**Sensitivity to static discharge**
Yes

**Sensitivity to static impact**
Not applicable

5.3 Advice for fire-fighters

Wear full protective clothing and self-contained breathing apparatus (SCBA) approved for fire fighting. This is necessary to protect against the hazards of heat, products of combustion and oxygen deficiency. Do not breathe smoke, gases or vapors generated.

**COMMENTS:**
(See Section 10, Stability and Reactivity)

6. Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

Before cleanup measures begin, review the entire SDS with particular attention to Section 2, Hazards Identification; and Section 8, Exposure Controls/Personal Protection. Remove all sources of ignition. Spilled material can catch fire spontaneously on contact with air, moisture, acids or oxidizing materials.

6.2 Environmental precautions

Contain spill. Do not wash into drains. Dispose of at qualified waste disposal facility.

6.3 Methods and material for containment and cleaning up

Remove all sources of ignition. Spilled material can catch fire spontaneously on contact with air, moisture, acids or oxidizing materials. Cover spill with dry extinguishant. DO NOT USE WATER OR CARBON DIOXIDE. Contain spill with absorbent. Expose to air until solvent has dissipated. Sweep up
and place in approved transport container. Dispose of waste according to local and Federal laws and regulations.

6.4 **Reference to other sections**
Before cleanup measures begin, review the entire SDS with particular attention to Section 2, Hazards Identification; and Section 8, Exposure Controls/Personal Protection.

6.5 **Additional information**
Not specified.

### 7. Handling and Storage

#### 7.1 Precautions for safe handling
Use in a closed system under argon or nitrogen. Do not get in eyes, on skin or clothing. Do not breathe vapors or mist.

#### 7.2 Conditions for safe storage, including any incompatibilities
Store in a cool place. Keep container closed. Keep away from sources of ignition, water, air, acids and oxidizing agents.

7.3 **Specific end use(s)**
For use only as a chemical intermediate under Strictly Controlled Conditions

### 8. Exposure Controls / Personal Protection

8.1 **Control parameters**

**DNEL:**
- Long-term exposure, systemic, inhalation: Not available
- Long-term exposure, systemic, dermal: Not available

**PNEC:**
Not available

**EXPOSURE LIMITS**

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>EU TWA</th>
<th>STEL</th>
<th>EH40 (UK WEL) TWA</th>
<th>STEL</th>
<th>USA (ACGIH) TWA</th>
<th>STEL/Ceiling</th>
<th>USA (OSHA) PEL</th>
<th>STEL/Ceiling</th>
</tr>
</thead>
<tbody>
<tr>
<td>methanol</td>
<td>200 ppm</td>
<td>200 ppm</td>
<td>200 ppm</td>
<td>250 ppm</td>
<td>200 ppm</td>
<td>250 ppm</td>
<td>200 ppm</td>
<td>250 ppm</td>
</tr>
</tbody>
</table>

8.2 **Exposure controls**

**Engineering controls:**
Use in closed system under argon or nitrogen. If personal contact can occur, use local exhaust ventilation (explosion-proof), to keep airborne concentrations below exposure limits.

**Personal protective equipment**

**Eyes and Face:**
- Chemical splash goggles with a face shield.

**Respiratory:**
- Wear a respirator approved for protection against organic vapours and mists when adequate ventilation is not available
- US: NIOSH or MSHA approved
- Europe: CEN Class A type

**Protective Clothing:**

**Gloves:**
Nitrile (typical permeation breakthrough time >480 minutes)
These glove recommendations should not be used as the absolute basis for glove selection. Actual in-use conditions may vary glove performance from the controlled conditions of laboratory tests. Factors such as concentration and temperature, glove thickness and glove reuse, may affect performance. Other glove requirements, such as length, dexterity, cut, abrasion, puncture and snag resistance, or glove grip need to be considered in making your final selection. For flammable products, the recommended gloves provide chemical but not fire protection

**Other:** Rubber clothing.

**Work Hygienic Practices:**
Quick-drench eyewash and safety shower.
9. Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Liquid, clear colorless</td>
</tr>
<tr>
<td>Odor</td>
<td>That of an alcohol</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>100 ppm, (methanol)</td>
</tr>
<tr>
<td>pH</td>
<td>Reacts exothermically with water giving mixture with pH &gt;12</td>
</tr>
<tr>
<td>Melting point</td>
<td>-97.8 °C (methanol)</td>
</tr>
<tr>
<td>Boiling point</td>
<td>64.7 °C (methanol)</td>
</tr>
<tr>
<td>Flash point</td>
<td>12°C, Closed Cup (methanol)</td>
</tr>
<tr>
<td>Evaporation rate (butyl acetate = 1):</td>
<td>2.1 (methanol, approximate)</td>
</tr>
<tr>
<td>Flammability</td>
<td>Water reactive material in flammable liquid solvent</td>
</tr>
<tr>
<td>Flammable limits</td>
<td>Not applicable for formulation. For methanol (approximate):</td>
</tr>
<tr>
<td></td>
<td>Upper: 36%  Lower: 6%</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>92 mm Hg @ 20°C, (methanol, estimate)</td>
</tr>
<tr>
<td>Vapor density (air = 1):</td>
<td>3.5 (heptane)</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>0.8 g/ml</td>
</tr>
<tr>
<td>Solubility in water</td>
<td>Reacts exothermically with water</td>
</tr>
<tr>
<td>Partition coefficient n-octanol/ water</td>
<td>Not available</td>
</tr>
<tr>
<td>Autoignition temperature</td>
<td>Not available for formulation. 385 °C, (methanol)</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>Not available</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not available</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>Not explosive</td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>Not an oxidizer</td>
</tr>
</tbody>
</table>

9.2 Other information

- Self-reactive properties: Does not meet classification criteria.
- Pyrophoric properties: Does not meet classification criteria.
- Self-heating properties: Does not meet classification criteria.
- Water reactive properties: Does not meet classification criteria.
- Corrosive to metals: Does not meet classification criteria.
- Molecular weight: 37.97

10. Stability and Reactivity

10.1 Reactivity

Reactive with water and damp air

10.2 Chemical stability

Stable if kept away from air and moisture.

10.3 Possibility of hazardous reaction

Reaction with water, air, oxidizers, acids to form lithium hydroxide, lithium hydride, methanol

10.4 Conditions to avoid

Open air. Heat, sparks or flames

10.5 Incompatible materials

Heat, fire, air, water, acids and oxidizing chemicals

10.6 Hazardous decomposition products

None

11. Toxicological Information

11.1 Information on toxicological effects

The mixture has not been tested, but properties can be predicted based on the properties of the two components

(a) acute toxicity

Lithium methoxide in methanol: Corrosive Corrositex In-Vitro Skin Corrosion Assay

Methanol: Methanol: Oral LD50 = 5600 mg/kg (rat) [RTECS]

Inhalation LC50 = 64000 ppm/4H (rat) [RTECS]

Methanol is more acutely toxic to humans than to animals.

(b) skin corrosion/irritation

Classified as corrosive on the basis of lithium methoxide

(c) serious eye damage/irritation

Classified as corrosive on the basis of lithium methoxide

(d) respiratory/skin sensitisation

No components are considered to be potential sensitizing agents.

(e) germ cell mutagenicity

None of the components considered to be mutagenic.

(f) carcinogenicity

None of the components considered to be carcinogenic.

(g) reproductive toxicity

Classified as not a reproductive toxin based on lithium methoxide and methanol

(h) STOT-single exposure

STOT Single Exp. 1
Affected organs: Optic nerve (nervus opticus), central nervous system

(i) STOT-repeated exposure
Classified as not causing organ damage based on lithium t-amoxide and heptanes.

(j) aspiration hazard
None of the components are an aspiration hazard

**Acute Effects From Overexposure:**
No data available for the formulation. This product contains an alkali alkoxide compound which is extremely reactive and corrosive to the skin, eyes (may cause blindness), nose, throat and stomach.
Methanol: Contains methanol which is toxic if inhaled or swallowed. Methanol can very readily form extremely high vapor concentrations at room temperature. Target organ effects from methanol, including nervous system effects and vision disturbances. Methanol is more acutely toxic to humans than to animals.

**Chronic Effects From Overexposure:**
No data available for product.
Methanol: Effects of chronic poisoning from repeated exposure to methanol vapor include conjunctivitis, headache, giddiness, insomnia, gastric disturbance and failure of vision. In animal experiments, methanol has caused fetotoxic or teratogenic effects, in the absence of maternal toxicity. Methanol produced negative results in one animal test for skin sensitization.

**Carcinogenicity Listings**
EH40: Not listed.
IARC: Not listed.
NTP: Not listed.
OSHA: Not considered a carcinogen under OSHA.
ACGIH: Not listed.

12. Ecological Information

**12.1 Toxicity:**
The mixture has not been tested, but properties can be predicted based on the properties of the two components
Environmental toxicity testing of the product has not been carried out.
Methanol:
96 hour LC50 = 20,100 mg/L (rainbow trout)
96 hour LC50 = 29,400 mg/L (fathead minnow)
96 hour LC50 = 15,400 mg/L (bluegill)
24 hour EC50 > 10,000 mg/L (daphnia magna straus)
96 hour IC50 = 12,000 mg/L (shrimp)
[Handbook of Env. Data Organic Chem. 4th ed.]

**12.2 Persistence and degradability**
Lithium methoxide is expected to react violently with water or moisture, producing methanol and lithium hydroxide.
Methanol: Methanol is likely to volatize rapidly into the air because of its high vapor pressure. Methanol will dissolve rapidly in water. It is poorly absorbed onto soils or sediments. Methanol is biodegradable and not expected to bioaccumulate through food chains in the environment

**12.3 Bioaccumulative potential**
Not available.

**12.4 Mobility in soil**
Not available.

**12.5 Results of PBT and vPvB assessment**
A PBT and vPvB assessment has been undertaken for REACH and none of the components are considered to be of concern.

**12.6 Other adverse effects**
Due to the nature of the material and the specialist applications, this product is not considered to be a risk to the environment.
13. Disposal Considerations

13.1 Waste treatment methods

Disposal method:

- Do not discharge to waste water systems.
- Spent solvent may be sent for recovery or used as fuel if permitted under local regulations.
- Dispose of waste according to local and national laws and regulations.

14. Transport Information

14.1 UN Number

UN3286

14.2 UN proper shipping name (IMDG, ICAO, ADR, DOT)

Flammable liquid, toxic, corrosive, N.O.S. (lithium methoxide, methanol solution)

14.3 Transport hazard class(es) (IMDG, ICAO, ADR, DOT)

3, Flammable liquid, (6.1 Toxic, 8. Corrosive)

14.4 Packing group (IMDG, ICAO, ADR, DOT)

II

14.5 Environmental hazards

No

14.6 Special precautions for user

None

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

None

15. Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

EUROPEAN UNION:

German Wassergefährdungsklasse (water hazard class)

- lithium methoxide: not listed
- methanol: 1

UNITED STATES:

Section 311 Hazard Category (40 CFR 370):

Immediate (acute) health hazard, delayed (chronic) health hazard, fire hazard, reactive

Section 313 Reportable Ingredients (40 CFR 372):

This product contains methanol which is subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986.

Section 302 Extremely Hazardous Substances (40 CFR 355):

CERCLA Hazardous Substance (40 CFR 302.4):

Methanol is listed. The reportable quantity is 5000 pounds.

TSCA Sec 12b Export Notification:

This product is not subject to TSCA 12 (b) Export Notification Requirements.

NFPA Rating:

Health: 3  Flammability: 3  Reactivity: 2  Special: W

INTERNATIONAL INVENTORY STATUS:

<table>
<thead>
<tr>
<th>Inventory/Country</th>
<th>Product Status</th>
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<tbody>
<tr>
<td>EINECS (EU)</td>
<td>Listed</td>
</tr>
<tr>
<td>TSCA (US)</td>
<td>Listed</td>
</tr>
<tr>
<td>ECL (Korea)</td>
<td>Listed</td>
</tr>
<tr>
<td>DSL (Canada)</td>
<td>Not listed</td>
</tr>
</tbody>
</table>

15.2 Chemical Safety Assessment

Not available.

16. Other Information

European Union:

R Phrases:
Highly flammable. R11
Causes burns R34
Toxic by inhalation, in contact with skin and if swallowed R23/24/25
Toxic: danger of very serious irreversible effects through inhalation, in
contact with skin and if swallowed R39/23/24/25

List of Abbreviations used in this SDS:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PBT</td>
<td>Persistent, Bioaccumulative and Toxic</td>
</tr>
<tr>
<td>vPvB</td>
<td>very Persistent, very Bioaccumulative</td>
</tr>
<tr>
<td>PEC</td>
<td>Predicted environmental concentration</td>
</tr>
<tr>
<td>PNEC</td>
<td>Predicted no effect concentration</td>
</tr>
<tr>
<td>DNEL</td>
<td>Derived no effect level</td>
</tr>
</tbody>
</table>

Specific uses identified for Exposure Scenarios

Not available

**REVISION SUMMARY:** Revision # 02. Sections 1 and 16 modified. Legal entity and addresses changed.

This SDS has been prepared to meet U. S. OSHA Hazard Communication Standard requirements. type 2c

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