Product Safety Data Sheet (PSDS) according to OSHA-GHS (29 CFR 1910.1200 HCS 2012) (US)

E Model Series (Pulsarlube E)

1. MANUFACTURER INFORMATION

1) Product Name: E Model Series (E60/EO60, E120/EO120, E240/EO240 etc.)
2) Recommended use of the chemical and restrictions on use
   A. Product description: An electrochemical automatic single point lubricator
   B. Restrictions on use: Not available except the intended use of the product
3) Supplier’s details

   KLT Co., Ltd.
   6-19, Hansan-ro, Tanhyeon-myneon,
   Paju-si, Gyeonggi-do,
   Republic of Korea
   Telephone Number for Information:
   6-19, Hansan-ro, Tanhyeon-myneon, Tel.: +82 (02) 2083-8488
   Paju-si, Gyeonggi-do, Fax: +82 (02) 2083-8485
   Republic of Korea
   sales.asia@pulsarlube.com
   Emergency telephone number +82 (02) 2083-8488

2. HAZARDS IDENTIFICATION

1) Hazard / Risk Classification

   Inhalation  May be harmful if inhaled. May cause respiratory tract irritation.
   (Specific target organ toxicity - single exposure (Category 3))
   Ingestion  Harmful if swallowed. (Acute toxicity, Oral (Category 4))
   Skin  May be harmful if absorbed through skin. May cause skin irritation.
   (Skin irritation (Category 2) Eye irritation (Category 2)

2) Label elements

   This product is defined as an "article" based on OSHA definition of an article (c).
   Therefore, this product is exempt from requirement of the Hazard Communication Standard, 29 CFR1910.1200
   (HCS 2012), hence a Safety-Data-Sheet is not required in accordance to HCS2012 (b)(6) and the sheets are
   supplied as a service. This Safety-Data-Sheet contains valuable information critical to the safe handling and
   proper use of the product.

3) Hazard/precautionary statements

   ○ Hazard/Risk Statement :
     H302 Harmful if swallowed
     H315 Causes skin irritation
     H319 Causes serious eye irritation

   ○ Precautionary Statement

<Prevention>
   P201 Obtain special instructions before use.
   P202 Do not handle until all safety precautions have been read and understand.
   P280 Wear protective gloves/protective clothing/eye protection/face protection.
<Response>
P302+P352 IF ON SKIN: Immerse in cool water [or wrap in wet bandages].
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P313 IF exposed or concerned: Get medical advice/attention

<Storage>
P403+P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.

<Disposal>
P501 Dispose of contents/containers to … in accordance with local/regional/national/international regulations (to be specified).

3) Other Hazard Risk which are not included in the classification criteria

<table>
<thead>
<tr>
<th>Material / NFPA</th>
<th>Health</th>
<th>Flammability</th>
<th>Reactivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Water</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2) Ethylene Glycol</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>3) Potassium carbonate</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4) Proprietary (S1)</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

3. COMPOSITION/INFORMATION ON INGREDIENTS

(Based on the electrolyte)

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Other name</th>
<th>CAS No</th>
<th>Content (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Water</td>
<td>DIHYDROGEN OXIDE</td>
<td>7732-18-5</td>
<td>95</td>
</tr>
<tr>
<td>2) Ethylene Glycol</td>
<td>1,2-Ethanediol 1,2-Dihydroxyethane</td>
<td>107-21-1</td>
<td>0.3</td>
</tr>
<tr>
<td>3) Potassium carbonate</td>
<td>Carbonic Acid Dipotassium Salt</td>
<td>584-08-7</td>
<td>3.0</td>
</tr>
<tr>
<td>4) Proprietary (S1)</td>
<td>Proprietary (S1)</td>
<td>Proprietary (S1)</td>
<td>Proprietary (S1)</td>
</tr>
</tbody>
</table>

Comment on component parts

The concentrations of the ingredients are valid for gas generation cell. They are not for the complete system. The structural design prevents release of the hazardous materials (or mixture) contained therein when the unit is used for its intended purpose. Substances of Very High Concern - SVHC: substances are not contained or are below 0.1%. For full text of H-statements: see SECTION 2

4. FIRST AID MEASURES

General advice
Take proper precautions to ensure your own health and safety before attempting rescue and providing first aid. Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

In case of skin contact
Wash skin with soap and copious amounts of water. Consult a physician.

If inhaled
Remove person to fresh air. If signs/symptoms continue, get medical attention. Give oxygen or artificial respiration as needed.
In case of eye contact
Thoroughly flush the eyes with large amounts of clean low-pressure water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation persists, consult a physician.

If swallowed
DO NOT induce vomiting. If vomiting does occur, have victim lean forward to prevent aspiration. Rinse mouth with water. Seek medical attention. Never give anything by mouth to an unconscious individual.

5. FIRE FIGHTING MEASURES

Extinguishing media

Suitable extinguishing media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Special hazards arising from the substance or mixture
Carbon oxides, Potassium oxides, Hydrogen iodide,

Advice for firefighters
Wear self-contained breathing apparatus for fire-fighting if necessary.

Further information
None

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

Environmental precautions
Do not let product enter drains.

Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal

Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist and avoid formation of dust and aerosols.

Conditions for safe storage, including any incompatibilities
Store in cool place. Keep container tightly closed in a dry and well-ventilated place. Hygroscopic. air, light, and moisture sensitive. Store under inert gas.

Specific end uses
no data available

8. EXPOSURE CONTROLS/PERSONAL PROTECTION
(Based on the electrolyte)

Control parameters
○ ACGIH : none
○ biological limit values : none

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

**Personal protective equipment**

**Respiratory protection**
Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary.

**Eye protection**
Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts.

**Hands protection**
Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

**Body protection**
Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

9. **PHYSICAL AND CHEMICAL PROPERTIES**

Information on basic physical and chemical properties. Described by individual ingredient

1) **Ethylene Glycol**

   a) Appearance
   Liquid, Colourless

   b) Odour
   no data available

   c) Odour threshold
   no data available

   d) pH
   no data available

   e) Meting point/freezing point
   melting point/range : -13°C

   f) Initial boiling point and boiling range
   196 ~ 198°C

   g) Flash point
   111°C - closed cup

   h) Evaporation rate
   1

   i) Flammability (solid, gas)
   no data available

   j) Upper/lower flammability or explosive limits
   Upper explosion limit : 15.3%(V)
   Lower explosion limit : 3.2%(V)

   k) Vapor pressure
   0.11 hPa at 20°C
   0.13 hPa at 20

   l) Vapor density
   2.14 – (Air = 1.0)

   n) Water solubility
   completely misciblesolube

   o) Partition coefficient: n-octanol/water
   log Pow.-1.36

   p) Auto-ignition temperature
   no data available
2) Potassium carbonate

a) Appearance
   Powder, White

b) Odour
   no data available

c) Odour threshold
   no data available

d) pH
   11.0 ~ 13 at 138 g/l at 25°C

e) Melting point/freezing point
   melting point/range : 891°C

f) Initial boiling point and boiling range
   no data available

g) Flash point
   no data available

h) Evaporation rate
   no data available

i) Flammability (solid, gas)
   no data available

j) Upper/lower flammability or explosive limits
   no data available

l) Vapor density
   no data available

m) Relative density
   2.43 g/mL at 25°C

n) Water solubility
   138 g/l at 20°C - completely soluble

o) Partition coefficient: n-octanol/water
   no data available

p) Auto-ignition temperature
   no data available

q) Viscosity
   no data available

r) Explosive properties
   no data available

s) Oxidizing properties
   no data available

3) WATER

a) Appearance
   Liquid, Colourless
b) Odour  
   no data available

c) Odour threshold  
   no data available

d) pH  
   6.0 ~ 8.0 at 25℃

e) Melting point/freezing point  
   0.0℃

f) Initial boiling point and boiling range  
   100℃ - lit

g) Flash point  
   no data available

h) Evaporation rate  
   no data available

i) Flammability (solid, gas)  
   no data available

j) Upper/lower flammability or explosive limits  
   no data available

k) Vapor pressure  
   no data available

l) Vapor density  
   no data available

m) Relative density  
   1,000 g/cm³ at 3.98℃

n) Water solubility  
   completely miscible

o) Partition coefficient: n-octanol/water  
   no data available

p) Auto-ignition temperature  
   no data available

q) Decomposition temperature  
   no data available

r) Viscosity  
   no data available

s) Explosive properties  
   no data available

t) Oxidizing properties  
   no data available

10. STABILITY AND REACTIVITY
   Information on basic stability and reactivities. Described by individual ingredient

1) Ethylene Glycol

   Reactivity  
   no data available

   Chemical stability  
   no data available

   Possibility of hazardous reactions  
   no data available

   Conditions to avoid  
   no data available

   Incompatible materials  
   Strong acids, Strong oxidizing agents, Strong bases, Aldehydes, aluminum

   Hazardous decomposition products
2) Potassium carbonate

Reactivity
no data available
Chemical stability
no data available
Possibility of hazardous reactions
no data available
Conditions to avoid
Exposure to moisture
Incompatible materials
Acids, Strong oxidizing agents
Hazardous decomposition products
Other decomposition products - no data available

3) WATER

Reactivity
no data available
Chemical stability
no data available
Possibility of hazardous reactions
no data available
Conditions to avoid
no data available
Incompatible materials
no data available
Hazardous decomposition products
no data available

11. TOXICOLOGICAL INFORMATION
Information on basic toxicological properties. Described by individual ingredient

1) Ethylene Glycol

Information on toxicological effects

Acute toxicity
LD50 Oral - rat - 4.700 mg/kg
LD50 Dermal - rabbit - 10.626 mg/kg

Skin corrosion/irritation
no data available

Serious eye damage/eye irritation
Eyes - rabbit - Mild eye irritation - 24 h

Respiratory or skin sensitization
no data available

Germ cell mutagenicity
no data available

Carcinogenicity
This product is or contains a component that is probably not carcinogenic based on its IARC, ACGIH, NTP, or EPA classification.

IARC : No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Reproductive toxicity
Laboratory experiments have shown teratogenic effects.
Overexposure may cause reproductive disorder(s) based on tests with laboratory animals.

**Specific target organ toxicity - single exposure**
no data available

**Specific target organ toxicity - repeated exposure**
no data available

**Aspiration hazard**
no data available

**Potential health effects**
- **Inhalation**: May be harmful if inhaled. May cause respiratory tract irritation.
- **Ingestion**: Harmful if swallowed.
- **Skin**: May be harmful if absorbed through skin. May cause skin irritation.
- **Eyes**: Causes eye irritation.

**Signs and Symptoms of Exposure**
When ingested, early symptoms mimic alcohol inebriation and are followed by nausea, vomiting, abdominal pain, weakness, muscle tenderness, respiratory failure, convulsions, cardiovascular collapse, pulmonary edema, hypocalcemic tetany, and severe metabolic acidosis. Without treatment, death may occur in 8 to 24 hours. Victims who survive the initial toxicity period usually develop renal failure along with brain and liver damage. Exposure to and/or consumption of alcohol may increase toxic effects.

**Additional Information**
RTECS: KW2975000

2) Potassium carbonate

**Information on toxicological effects**

**Acute toxicity**
LD50 Oral - rat - 1.870 mg/kg

**Skin corrosion/irritation**
no data available

**Serious eye damage/eye irritation**
no data available

**Respiratory or skin sensitization**
no data available

**Germ cell mutagenicity**
Genotoxicity in vivo - rat - Oral
 Unscheduled DNA synthesis

**Carcinogenicity**
IARC:
No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

**Reproductive toxicity**
no data available

**Specific target organ toxicity - single exposure**
Inhalation - May cause respiratory irritation.

**Specific target organ toxicity - repeated exposure**
no data available

**Aspiration hazard**
no data available

**Potential health effects**
Inhalation: May be harmful if inhaled. Causes respiratory tract irritation.
Ingestion: Harmful if swallowed.
Skin: May be harmful if absorbed through skin. Causes skin irritation.
Eyes: Causes serious eye irritation.

Signs and Symptoms of Exposure
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Additional Information
RTECS: TS7750000

3) WATER

Information on toxicological effects

Acute toxicity
no data available

Skin corrosion/irritation
no data available

Serious eye damage/eye irritation
no data available

Respiratory or skin sensitization
no data available

Germ cell mutagenicity
no data available

Carcinogenicity
IARC:
No component of this product present at levels greater than or equal to 0.1% is identified as Probable, possible or confirmed human carcinogen by IARC.

Reproductive toxicity
no data available

Specific target organ toxicity - single exposure
no data available

Specific target organ toxicity - repeated exposure
no data available

Aspiration hazard
no data available

Potential health effects
Inhalation: May cause respiratory tract irritation.

Signs and Symptoms of Exposure
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Additional Information
RTECS: ZC0110000

12. ECOLOGICAL INFORMATION
Information on basic ecological properties. Described by individual ingredient

1) Ethylene Glycol
Toxicity
Toxicity to fish
LC50 - Oncorhynchus mykiss (rainbow trout) - 18.500 mg/l - 96 h
LC50 - Leuciscus idus (Golden orfe) - > 10.000 mg/l - 48 h
NOEC - Pimephales promelas (fathead minnow) - 32.000 mg/l - 7 d
NOEC - Pimephales promelas (fathead minnow) - 39.140 mg/l - 96 h
Toxicity to daphnia and other aquatic invertebrates
EC50 - Daphnia magna (Water flea) - 74.000 mg/l - 24 h
NOEC - Daphnia - 24.000 mg/l - 48 h
LC50 - Daphnia magna (Water flea) - 41.000 mg/l - 48 h

Persistence and degradability
no data available

Bioaccumulative potential
Does not bioaccumulate.
Bioaccumulation other fish - 61 d -50 mg/l
Bioconcentration factor (BCF): 0,60

Mobility in soil
no data available

Results of PBT and vPvB assessment
no data available

Other adverse effects
no data available

2) Potassium carbonate

Toxicity
Toxicity to fish
LC50 - Pimephales promelas (fathead minnow) - < 510 mg/l - 96 h

Persistence and degradability
no data available

Bioaccumulative potential
no data available

Mobility in soil
no data available

Results of PBT and vPvB assessment
no data available

Other adverse effects
no data available

3) WATER

Toxicity
no data available

Persistence and degradability
not applicable

Bioaccumulative potential
no data available

Mobility in soil
no data available

Results of PBT and vPvB assessment
no data available

Other adverse effects
13. DISPOSAL CONSIDERATIONS

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product

Above all, dispose of in accordance with all applicable federal, state and local regulations.

14. TRANSPORT INFORMATION

UN number
ADR/RID: -  IMDG: -  IATA: -

UN proper shipping name
ADR/RID: -  IMDG: -  IATA: -

Transport hazard class(es)
ADR/RID: -  IMDG: -  IATA: -

Packaging group
ADR/RID: -  IMDG: -  IATA: -

Environmental hazards
ADR/RID: no  IMDG Marine pollut: no  IATA: no

Special precautions for user
no data available

15. REGULATORY INFORMATION

REGULATORY INFORMATION
This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006.

Safety, health and environmental regulations/legislation specific for the substance or mixture
no data available

Chemical Safety Assessment
no data available

16. OTHER INFORMATION

1) Source of the data
(1) Chemical manufacturer’s information : SDS(SAFETY DATA SHEET) Data
(2) Chem Guide CAS DataBase
(3) Corporate Solution From Thomson Micromedex(http://csi.micromedex.com)
(4) ECB-ESIS(European chemical Substances Information System)(http://ecb.jrc.it/esis)
(5) ECOTOX Database, EPA(http://cfpub.epa.gov/ecotox)
(6) IUCLID Chemical Data Sheet, EC-ECB
(7) International Chemical Safety Cards(ICSC)(http://www.nihs.go.jp/ICSC)
(9) The Chemical Database, The Department of Chemistry at the University of Akron (http://ull.chemistry.uakron.edu/erd)
Further information

Pulsarlube has prepared copyrighted Product Safety Datasheets to provide information on the different Pulsarlube automatic grease lubricator systems. As defined in the text above, Pulsarlube automatic grease lubricators are manufactured articles, which do not result in exposure to a hazardous chemical under normal conditions of use. The information and recommendations set forth herein are made in good faith, for information only, and are believed to be accurate as of the date of preparation. However, Pulsarlube USA, Inc. makes no warranty, either express or implied, with respect to this information and disclaims all liability from reference on it.