1. MANUFACTURER INFORMATION

1) Product Name : Pulsarlube PL1 (Multipurpose Grease)
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
   Pulsarlube GmbH
   Silostrasse 31b, 65929 Frankfurt am Main, Germany
   Telephone Number for Information: Tel.: +49 (69) 8700-766-62/-63
   Fax : +49 (69) 8700-766-69
   Emergency telephone number +49 (69) 8700-766-62/-63

2. HAZARDS IDENTIFICATION

1) Classification of the substance/mixture
   Classification according to Regulation (EC) No 1272/2008 [CLP]
   - Skin corrosion/irritation : Category2, H315
   - Serious eye damage/irritation : Category2, H319
   - Specific target organ toxicity(Repeated exposure) : Category2, H373

2) Label elements
   Labelling according to Regulation (EC) No 1272/2008 [CLP]
   ○ Hazard Pictogram(s)
   ○ Signal word : Warning
   ○ Hazard statement :
     H315 Causes skin irritation
     H319 Causes serious eye irritation
     H373 May cause damage to organs through prolonged or repeated exposure (Refer Section SDS 11)
   ○ Precautionary Statement
     <Prevention>
     P260 Do not breathe dust/fume/gas/mist/vapours/spray.
     P264 Wash hands thoroughly after handling.
     P280 Wear protective gloves/protective clothing/eye protection/face protection..
<Response>
P302+P352 IF ON SKIN: Wash with plenty of soap and water.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P314 Get medical advice/attention if you feel unwell.
P321 Specific treatment
P332+P313 If skin irritation occurs: Get medical advice/attention.
P337+P313 If eye irritation persists: Get medical advice/attention.
P362 Take off contaminated clothing and wash before reuse.

<Storage>
Not Applicable

<Disposal>
P501 Dispose of contents/container in accordance with local/regional/national/international regulation

3) Other hazards
Not available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substances
Not applicable

Mixtures

<table>
<thead>
<tr>
<th>Name</th>
<th>EC No.</th>
<th>CAS No.</th>
<th>REACH Registration No.</th>
<th>% [weight]</th>
<th>Classification [1272/2008/EC]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distillates (petroleum), hydrotreated heavy paraffinic</td>
<td>265-157-1</td>
<td>64742-54-7</td>
<td>-</td>
<td>60.0 ~ 70.0</td>
<td>Not classified</td>
</tr>
<tr>
<td>Lithium metaborate</td>
<td>236-631-5</td>
<td>13453-69-5</td>
<td>-</td>
<td>1.0 ~ 10.0</td>
<td>Not classified</td>
</tr>
<tr>
<td>Phosphorodithioic acid O,O-bis(2-ethylhexyl) ester, zinc salt</td>
<td>224-235-5</td>
<td>4259-15-8</td>
<td>-</td>
<td>0.1 ~ 1.0</td>
<td>Aquatic Acute 1, H400 Eye Irrit. 2, H319</td>
</tr>
<tr>
<td>Secret</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Secret</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

Description of first aid measures

General
No general information.

Inhalation
When exposed to large amounts of steam and mist, move to fresh air.
Take specific treatment if needed.
Get medical attention immediately.

Skin contact
Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.
Wash contaminated clothing thoroughly before re-using.
Get medical attention immediately.
Go to the hospital immediately if symptoms (flare, irritate) occur.
Wash thoroughly after handling.

Eye contact
Do not rub your eyes.
Immediately flush eyes with plenty of water for at least 15 minutes and call a doctor/physician. 
Get medical attention immediately.
Go to the hospital immediately if symptoms (flare, irritate) occur.
Remove contact lenses if worn.

**Ingestion**
Please be advised by doctor whether induction of vomit is demanded or not.
Rinse your mouth with water immediately.
Get medical attention immediately.

**Most important symptoms and effects, both acute and delayed**
Not available

**Indication of any immediate medical attention and special treatment needed**
Notify medical personnel of contaminated situations and have them take appropriate protective measures.

5. **FIREFIGHTING MEASURES**

**Extinguishing media**

**Suitable extinguishing media**
- Dry chemical, carbon dioxide, regular foam extinguishing agent, spray

**Unsuitable extinguishing media**
- Avoid use of water jet for extinguishing

**Special hazards arising from the substance or mixture**

**Hazardous combustion products**
Not available

**Advice for firefighters**
- Cool containers with water until well after fire is out.
- Keep unauthorized personnel out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- Wear appropriate protective equipment.
- Keep containers cool with water spray.
- Use fire fighting procedures suitable for surrounding area.

6. **ACCIDENTAL RELEASE MEASURES**

**Personal Precautions, protective equipment and emergency procedures**

**For non-emergency personnel**
- Protective equipment: Wear proper protective equipment.
- Emergency procedures: Not applicable
- If required, notify relevant authorities according to all applicable regulations.

**For emergency responders**
- Ventilate closed spaces before entering.
- Must work against the wind, let the upwind people to evacuate.
- Do not touch spilled material. Stop leak if you can do it without risk.
- Handle the damaged containers or spilled material after wearing appropriate protective equipment
- Avoid skin contact and inhalation.

**Environmental precautions**
- Prevent runoff and contact with waterways, drains or sewers.
- If large amounts have been spilled, inform the relevant authorities.
- Avoid dispersal of spilt material and runoff and contact with waterways, drains and sewers. If large spills, advise emergency services.
Methods and material for containment and cleaning up

For containment
Clear spills immediately
Clean up all spills immediately.
Prevent, by any means available, spillage from entering drains or water course.
Stop leak if safe to do so.

For cleaning up
Large spill: Stay upwind and keep out of low areas. Dike for later disposal.
Notify the central and local government if the emission reach the standard threshold.
Disposal of waste shall be in compliance with the Wastes Control? Act
Appropriate container for disposal of spilled material collected.
Small liquid state spills: Appropriate container for disposal of spilled material collected.
Put the spilled material in an appropriate containers and clean the contaminated area.

Other information
Slippery when spilt.

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 information on disposal.

7. HANDLING AND STORAGE

Precautions for safe handling
Avoid direct physical contact.
Get the manual before use.
Refer to Engineering controls and personal protective equipment.
Do not handle until all safety precautions have been read and understood.

Conditions for safe storage, including any incompatibilities
Save in cool, dry and well ventilated place.
Check regularly for leaks.
Please pay attention to incompatibilities materials and conditions to avoid.
Keep sealed when not in use.
No open fire.
Collected them in sealed containers.

Specific end uses
See Section 1 for information on 1.2 Relevant identified uses.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Occupational exposure limits
European Union (EU) Commission Directive 2006/15/EC (IOELVs)
Not available

Recommended Monitoring Procedures
Personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

DNEL/PNEC - Values
Not available
Exposure controls

Appropriate engineering controls
Business owner is recommended to maintain below recommended exposure limits for the working place with general exhaust of gas/vapour/mist/fume.

Individual protection measures, such as personal protective equipment

Hand protection
Wear appropriate glove.

Eye protection
Wear primary eye protection such as splash resistant safety goggles with a secondary protection face shield. Provide an emergency eye wash station and quick drench shower in the immediate work area.

Respiratory Protection
Respiratory protection is ranked in order from minimum to maximum.
Consider warning properties before use.
Under conditions of frequent use or heavy exposure, Respiratory protection may be needed.
Dust, mist, fume-purifying respiratory protection
Air-purifying respirator with high-efficiency particulate filtering
Any respiratory protection with a electromotion fan(for dust, mist, fume-purifying)
Self-contained breathing apparatus with a corpuscle filter of high efficiency
For Unknown Concentration or Immediately Dangerous to Life or Health : Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply.
Any self-contained breathing apparatus with a full facepiece.

Skin protection
Wear appropriate clothing.

Environmental exposure controls
Do not let product enter drains. For ecological information refer to section 12.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>a) Appearance(State)</th>
<th>Paste</th>
</tr>
</thead>
<tbody>
<tr>
<td>b) Appearance(Color)</td>
<td>Brown</td>
</tr>
<tr>
<td>c) Odor</td>
<td>Characteristic</td>
</tr>
<tr>
<td>d) Odor threshold</td>
<td>Not available</td>
</tr>
<tr>
<td>e) pH</td>
<td>Not available</td>
</tr>
<tr>
<td>f) Melting point/Freezing point</td>
<td>Not available</td>
</tr>
<tr>
<td>g) Initial boiling point and boiling range</td>
<td>Not available</td>
</tr>
<tr>
<td>h) Flash point</td>
<td>Not available</td>
</tr>
<tr>
<td>i) Evaporation rate</td>
<td>Not available</td>
</tr>
<tr>
<td>j) Flammability(solid, gas)</td>
<td>Not available</td>
</tr>
<tr>
<td>k) Upper/Lower Flammability or explosive limits</td>
<td>Not available</td>
</tr>
<tr>
<td>l) Vapour pressure</td>
<td>Not available</td>
</tr>
<tr>
<td>m) Vapour density</td>
<td>Not available</td>
</tr>
<tr>
<td>n) Relative density</td>
<td>approx. 0.92 at 20°C</td>
</tr>
<tr>
<td>o) Solubility</td>
<td>Insoluble</td>
</tr>
<tr>
<td>p) Partition coefficient of n-octanol/water</td>
<td>Not available</td>
</tr>
<tr>
<td>q) Autoignition temperature</td>
<td>Not available</td>
</tr>
<tr>
<td>r) Decomposition temperature</td>
<td>Not available</td>
</tr>
<tr>
<td>s) Viscosity</td>
<td>Not available</td>
</tr>
<tr>
<td>t) Explosive properties</td>
<td>Not available</td>
</tr>
<tr>
<td>u) Oxidising properties</td>
<td>Not available</td>
</tr>
</tbody>
</table>

Other information
Not available
10. STABILITY AND REACTIVITY

Reactivity
Not available

Chemical Stability
This material is stable under recommended storage and handling conditions.

Possibility of hazardous reactions
Hazardous Polymerization will not occur.

Conditions to avoid
Avoid contact with incompatible materials and condition.
Avoid : Accumulation of electrostatic charges, Heating, Flames and hot surfaces

Incompatible materials
Not available

Hazardous decomposition products
May emit flammable vapour if involved in fire.

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Oral
Product (ATEmix) : 2000mg/kg < ATEmix <= 5000mg/kg
[Secret3] : LD50 = 2500 mg/kg Rat
[Secret4] : LD50 > 18000 mg/kg Rat
[Phosphorodithioic acid O,O-bis(2-ethylhexyl) ester, zinc salt] : LD50 3100 mg/kg Rat, (LD50 2000 ~ 5000 mg/kg Rat (ECHA))

Dermal
Product (ATEmix) : >5000mg/kg
[Secret3] : LD50 = 5520 mg/kg Rat
[Phosphorodithioic acid O,O-bis(2-ethylhexyl) ester, zinc salt] : LD50 > 5000 mg/kg Rabbit (ECHA)

Inhalation
Not available

Skin corrosion/irritation
Causes skin irritation

Serious eye damage/irritation
Causes serious eye irritation

Respiratory sensitization
Not available

Skin sensitization
Not available

Germ cell mutagenicity
Not available

Carcinogenicity

IARC
Not available
OSHA
Not available

ACGIH
Not available

NTP
Not available

EU CLP
[Distillates (petroleum), hydrotreated heavy paraffinic] : Carc. 1B (Note L)

Reproductive toxicity
Not available

Specific target organ toxicity(single exposure):
Not available

Specific target organ toxicity(repeated exposure):
May cause damage to organs through prolonged or repeated exposure

Aspiration hazard
Not available

12. ECOLOGICAL INFORMATION

Toxicity
○ Fish
  - [Secret2] : LC50 5600 \text{mg}/\text{L} 96 hr Oncorhynchus mykiss (ECOTOX)
  - [Lithium metaborate] : LC50 897000 \text{mg}/\text{L} 96 hr (Estimate)
  - [Secret3] : LC50 = 25042.387 \text{mg}/\text{L} 96 hr (Estimate)
  - [Secret4] : LC50 0.0000000000546 \text{mg}/\text{L} 96 hr (Even accepting the 1mg / L is less than the test material is difficult to dissolve the medium is not classified. (Solubility : 0.000000000000002551mg/L) Water Solubility at 25 deg C (mg/L): 0.0000000000000002551) (Estimate)
  - [Phosphorodithioic acid O,O-bis(2-ethylhexyl) ester, zinc salt] : LC50 1 \text{mg}/\text{L} 96 hr Pimephales promelas (IUCLID), LC50 >46 \text{mg}/\text{L} 96 hr (Cyprinodon variegatus)(ECHA)
  - [Secret8] : LC50 0.00000153 \text{mg}/\text{L} 96 hr (Estimate)

○ Invertebrate
  - [Lithium metaborate] : LC50 647000 \text{mg}/\text{L} 48 hr (Estimate)
  - [Secret3] : LC50 = 40.299 \text{mg}/\text{L} 48 hr (Estimate)
  - [Secret4] : EC50 0.0000000000000000297 \text{mg}/\text{L} 48 hr (Even accepting the 1mg / L is less than the test material is difficult to dissolve the medium is not classified. (Solubility : 0.000000000000002551mg/L) Water Solubility at 25 deg C (mg/L): 0.0000000000000002551) (Estimate)
  - [Phosphorodithioic acid O,O-bis(2-ethylhexyl) ester, zinc salt] : EC50 1 \text{mg}/\text{L} 48 hr Daphnia magna (OECD TG 202(GLP)) (IUCLID)
  - [Secret8] : EC50 0.00000361 \text{mg}/\text{L} 48 hr (Estimate)

○ Algae
  - [Lithium metaborate] : EC50 2911000 \text{mg}/\text{L} 96 hr (Estimate)
  - [Secret3] : EC50 = 11.563 \text{mg}/\text{L} 96 hr (Estimate)
  - [Phosphorodithioic acid O,O-bis(2-ethylhexyl) ester, zinc salt] : EC50 1 \text{mg}/\text{L} 96 hr Selenastrum capricornutum (OECD TG 201(GLP)) (IUCLID)
  - [Secret8] : EC50 0.000114 \text{mg}/\text{L} 96 hr (Estimate)

Persistence and degradability
○ Persistence
  - [Secret1] : log Kow 2.60 (Estimate)
  - [Secret3] : log Kow = -1.37 (NLM/HSDB)
  - [Secret4] : log Kow 23.29 (Estimate)
  - [Phosphorodithioic acid O,O-bis(2-ethylhexyl) ester, zinc salt] : log Kow 3.59 (ECHA)
Bioaccumulative potential
- Bioaccumulation
  - [Secret1] : BCF 56.23 (Estimate)
  - [Lithium metaborate] : BCF 3.162 (Estimate)
  - [Secret3] : BCF = 3 (NLM/HSDB)
  - [Phosphorodithioic acid O,O-bis(2-ethylhexyl) ester, zinc salt] : 2000 (L/kg)(ECHA)
  - [Secret8] : BCF 17.39 (Estimate)
- Biodegradability
  - [Phosphorodithioic acid O,O-bis(2-ethylhexyl) ester, zinc salt] : 5 % 27 day(ECHA)
  - [Secret8] : non-Degradability - no potential for degradation and high potential for in vivo accumulation

Mobility in soil
Not available

Results of PBT and vPvB assessment
Not available

Other adverse effects
Not available

13. DISPOSAL CONSIDERATIONS

Waste treatment methods
Stabilization and minimization treatment by incineration or similar method can be applied, if more than two kinds of designated wastes are in mixture state and it is impractical to separate them
Oil water separation technology shall be applied as pre-waste treatment if it is applicable
It shall be treated by incineration
Incinerate or perform stabilizing treatment.
Anyone with business license number who generates industrial wastes shall treat the waste by him/herself or by entrusting to the legal entities who treat the wastes, recycle the wastes of others or install and operate the waste treatment facilities according to the Wastes Control Act
Dispose of waste in accordance with all applicable laws and regulations.

14. TRANSPORT INFORMATION

UN No.

UN No. (ADR/RID/ADN)
Not applicable

UN No. (IMDG CODE/IATA DGR)
Not applicable

UN No. (ICAO)
Not applicable

UN proper shipping name
Not applicable

Transport hazard class(es)

ADR/RID/ADN Class
Not applicable

ADR/RID/ADN Class
Not available
ADR Label No.
Not applicable

IMDG Class
Not applicable

ICAO Class/Division
Not applicable

Transport Labels
Not applicable

Packing group

ADR/RID/ADN Packing group
Not applicable

IMDG Packing group
Not applicable

ICAO Packing group
Not available

Environmental hazards
Not applicable

Special precautions for user
- Local transport follows in accordance with Dangerous goods Safety Management Law.
- Package and transport follow in accordance with Department of Transportation (DOT) and other regulatory agency requirements.
- EmS FIRE SCHEDULE : Not available
- EmS SPILLAGE SCHEDULE : Not available
- Air transport(IATA): Not subject to IATA regulations.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable

15. REGULATORY INFORMATION

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

Europe regulatory

REACH Restricted substance under REACH
- Applicable (Distillates (petroleum), hydrotreated heavy paraffinic)

REACH Substances subject to authorization under REACH
Not applicable

REACH SVHC
Not applicable

Europe PBT
Not applicable

European Union (EU) Transport of Dangerous Goods by Road - Dangerous Goods List
Not applicable

Chemical Safety Assessment
Not conducted
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)
   (10) Korea Information System for Chemical Safety, KISChem (http://kischem.nier.go.kr)
   (11) Chemical information system (http://ncis.nier.go.kr)
   (12) Grease Raw material manufacturer’s information : PSDS(PRODUCT SAFETY DATA SHEET) Data

2) The first creation date : 2015.02.11

3) The number of times, and the final revision date : Revision times 06
   The final revision date : 2020.11.23

Further information

Pulsarlube has prepared copyrighted Product Safety Datasheets to provide information on the different Pulsarlube automatic grease lubricator systems. As defined in above the text Pulsarlube automatic grease lubricator 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.