1. MANUFACTURER INFORMATION

1) Product Name : Pulsarlube PL3 (High Speed 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
   sales.eu@pulsarlube.com
   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]
   Not applicable

2) Label elements
   Labelling according to Regulation (EC) No 1272/2008 [CLP]
   ○ Hazard Pictogram(s)
     Not applicable
   ○ Signal word    : Not applicable
   ○ Hazard statement(s)
     Not applicable
   ○ Precautionary Statement
     <Prevention>
     Not applicable
     <Response>
     Not applicable
     <Storage>
     Not Applicable
     <Disposal>
     Not applicable

3) Other Hazards
   Not applicable
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>50.0 ~ 60.0</td>
<td>Not classified</td>
</tr>
<tr>
<td>Distillates, petroleum, solvent-refined heavy naphthenic</td>
<td>265-097-6</td>
<td>64741-96-4</td>
<td>-</td>
<td>10.0 ~ 20.0</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>1.0 ~ 5.0</td>
<td>Aquatic Acute 1, H400, Eye Irrit. 2, H319, STOT SE 3, H335, Skin Irrit. 2, H315</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. 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.

Eye contact
Do not rub your eyes.
Immediately flush eyes with plenty of water for at least 15 minutes and call a doctor/physician.

Ingestion
Please be advised by doctor whether induction of vomit is demanded or not.
Rinse your mouth with water 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. FIRE FIGHTING 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
Move containers from fire area, if you can do without the risk.
Cool containers with water until well after fire is out.
Avoid inhalation of materials or combustion by-products.
Do not approach the tank surrounded by fire until it is extinguished.
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
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.
Move container to safe area from the leak area.
Handle the damaged containers or spilled material after wearing appropriate protective equipment.

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
Clean up all spills immediately.
Control personal contact by using protective equipment.
Clear area of personnel and move up wind.
No smoking, flame or ignition sources.

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
Comply with all applicable laws and regulations for handling
Get the manual before use.
Dealing only with a well-ventilated place.
Do not handle until all safety precautions have been read and understood.
Conditions for safe storage, including any incompatibilities
Check regularly for leaks.
Keep in the original container.
Please pay attention to incompatibilities materials and conditions to avoid.
Keep sealed when not in use.
No open fire.

Specific end use(s)
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
European Union (EU) Commission Directive 2006/15/EC (IOELVs) - Skin
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. 0.89 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>
<tr>
<td>v) Other information</td>
<td>Not available</td>
</tr>
</tbody>
</table>

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
[Phosphorodithioic acid O,O-bis(2-ethylhexyl) ester, zinc salt] : LD50 3100 mg/kg Rat, (LD50 2000 ~ 5000 mg/kg Rat (ECHA))
[Secret5] : LD50 > 18000 mg/kg Rat
[Secret7] : LD50 3000 mg/kg Rat

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

**Inhalation**
Not available

Skin corrosion/irritation
Not available

Serious eye damage/irritation
Not available

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**
[Secret1] : Carc. 1B (Note L)
[Secret9] : Carc. 1B (Note L)
[Distillates (petroleum), hydrotreated heavy paraffinic] : Carc. 1B (Note L)
[Distillates, petroleum, solvent-refined heavy naphthenic] : Carc. 1B (Note L)

Reproductive toxicity
Not available

Specific target organ toxicity(single exposure):
Not available

Specific target organ toxicity(repeated exposure):
Not available

Aspiration hazard
Not available
12. ECOLOGICAL INFORMATION

Toxicity
○ Fish
  - [Phosphorodithioic acid O,O-bis(2-ethylhexyl) ester, zinc salt] : LC50 1 mg/l 96 hr Pimephales promelas (IUCLID), LC50 >46 mg/l 96 hr (Cyprinodon variegatus)(ECHA)
  - [Secret3] : LC50 0.00000153 mg/l 96 hr (Estimate)
  - [Secret5] : LC50 0.00000000546 mg/l 96 hr (Even accepting the 1mg / L is less than the test material is difficult to dissolve the medium is not classified. (Solubility : 0.0000000000000002551mg/L)Water Solubility at 25 deg C (mg/L): 0.000000000000002551) (Estimate)
  - [Secret7] : LC50 0.00000159 mg/L 96hr (estimate)
  - [Secret8] : LC50 0.000103 mg/l 96 hr (Estimate)
○ Invertebrate
  - [Phosphorodithioic acid O,O-bis(2-ethylhexyl) ester, zinc salt] : EC50 1 mg/l 48 hr Daphnia magna (OECD TG 202(GLP)) (IUCLID)
  - [Secret3] : EC50 0.00000361 mg/l 48 hr (Estimate)
  - [Secret5] : EC50 0.000000000297 mg/l 48 hr (Even accepting the 1mg / L is less than the test material is difficult to dissolve the medium is not classified. (Solubility : 0.00000000000002551mg/L)Water Solubility at 25 deg C (mg/L): 0.00000000000002551) (Estimate)
  - [Secret7] : LC50 0.00000318 mg/L 48hr (estimate)
  - [Secret8] : LC50 0.00018 mg/l 96 hr (Estimate)
○ Algae
  - [Phosphorodithioic acid O,O-bis(2-ethylhexyl) ester, zinc salt] : EC50 1 mg/l 96 hr Selenastrum capricornutum (OECD TG 201(GLP)) (IUCLID)
  - [Secret3] : EC50 0.000114 mg/l 96 hr (Estimate)
  - [Secret7] : EC50 0.0000335 mg/L 96hr (estimate)
  - [Secret8] : EC50 0.000168 mg/l 96 hr (Estimate)

Persistence and degradability
○ Persistence
  - [Secret2] : log Kow 2.60 (Estimate)
  - [Phosphorodithioic acid O,O-bis(2-ethylhexyl) ester, zinc salt] : log Kow 3.59 (ECHA)
  - [Secret3] : log Kow 11.67 (Estimate)
  - [Secret5] : log Kow 23.29 (Estimate)
  - [Secret7] : log Kow 11.05 (Estimate)
○ Degradability
  - Not available

Bioaccumulative potential
○ Bioaccumulation
  - [Secret2] : BCF 56.23 (Estimate)
  - [Phosphorodithioic acid O,O-bis(2-ethylhexyl) ester, zinc salt] : 2000 (L/kg)(ECHA)
  - [Secret3] : BCF 17.39 (Estimate)
  - [Secret8] : BCF 3.69 (Estimate)
○ Biodegradability
  - [Phosphorodithioic acid O,O-bis(2-ethylhexyl) ester, zinc salt] : 5 % 27 day(ECHA)
  - [Secret3] : 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 (Secret1)
Applicable (Secret9)
Applicable (Distillates (petroleum), hydrotreated heavy paraffinic)
Applicable (Distillates, petroleum, solvent-refined heavy naphthenic)

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 05
   The final revision date : 2020.11.24
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 MAKES NO WARRANTY, EITHER EXPRESS OR IMPLIED, WITH RESPECT TO THIS INFORMATION AND DISCLAIMS ALL LIABILITY FROM REFERENCE ON IT.