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|-------------------|------------|--|----------------------|--------------|
| PRODUCT | PL-2000S | S D S (SAFETY DATA SHEET) | CREATION DATE | 2009. 01. 05 |
| SERIAL NO. | KPM-08-010 | | VERSION | Rev.(4) |
| PROCESS | HiRENOL | | REVISION DATE | 2024. 01. 24 |

** In accordance with Regulation (EU) 2020/878 (REACH), Annex II*

SECTION 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Name of product : HiRENOL PL-2000S

UFI : E4D1-4C2T-CU8M-8SNE

1.2 Relevant identified uses of the substance of mixture and uses advised against

Relevant identified uses : Epoxy plasticizer for paint and flooring

Uses advised against : Industries can be used only / Strictly prohibited firearms

1.3 Details of the supplier of the safety data sheet

Manufacturer/Supplier : Kolon Industries, Inc.

Street address/P.O. Box :

- (H/Office) 110, Magokdong-ro, Gangseo-gu, Seoul, Korea
- (Plant) 128, Gongdan-ro, Gimcheon-si, Gyeongsangbuk-do, Korea
- (R&D Center) 110, Magokdong-ro, Gangseo-gu, Seoul, Korea

Telephone number (if possible, indicate telefax) :

- (H/Office) Performance Resin Business Team. +82-2-3677-6134
- (Plant) Performance Resin Production Team. +82-54-420-0140 / Technology Team. +82-54-420-0180
- (R&D Center) R&D Group 6. +82-2-2199-1300

E-mail address of competent person responsible for the SDS : jiwoo_choi@kolon.com

1.4 Emergency Telephone

Emergency Telephone number : 82-54-420-0189

Opening hours : 08:00 to 18:00 (Monday through Friday)

Other comments (e.g. language(s) of the phone service) : English, Korean

SECTION 2. HAZARDS IDENTIFICATION

2.1 Classification of the substance of mixture

HiRENOL PL-2000S is classified according to Regulation (EC) No 1272/2008 [CLP] :

- Skin Irrit. 2
- Skin Sens. 1
- Aquatic Chronic 3

2.2 Label elements

Hazard pictograms :



Signal word : Warning

Hazard statement :

- H315 Causes skin irritation
- H317 May cause an allergic skin reaction
- H412 Harmful to aquatic life with long lasting effects

Additional precautionary statements :

*** Prevention**

- P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
- P264 Wash thoroughly after handling.
- P272 Contaminated work clothing should not be allowed out of the workplace.
- P273 Avoid release to the environment.
- P280 Wear protective gloves/protective clothing/eye protection/face protection.

*** Response**

- P302+P352 If on skin : Wash with plenty of soap and water.

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P321 Specific treatment.

P332+P313 If skin irritation occurs : Get medical advice/attention.

P333+P313 If skin irritation or rash occurs: Get medical advice/attention.

P362 Take off contaminated clothing and wash before reuse.

P363 Wash contaminated clothing before reuse.

*** Storage**

P403+P233 Store in a well-ventilated place. Keep container tightly closed.

*** Disposal**

P501 Dispose of contents/container in accordance with waste treatment management regulation.

2.3 Other hazards

The substance meets the SVHC criteria set out in Article 57 of the REACH Regulation : vPvB(Article 57e)

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixture

Description of the mixture :

Oligomerisation and alkylation reaction products of 2-phenylpropene and phenol

| Chemical Name | REACH Registration No. | CAS No. | EC No. | Content(%) | Classification according to Regulation(EC) No. 1272/2008(CLP) |
|--|------------------------|------------|-----------|------------|---|
| Oligomerisation and alkylation reaction products of 2-phenylpropene and phenol | Closed information | 68512-30-1 | 700-960-7 | 100 | Skin Irrit. 2, H315 Skin sens 1, H317 Aquatic Chronic 3, H412 |

SECTION 4. FIRST-AID MEASURES

4.1 Description of first aid measures

General notes

- Remove contaminated, saturated clothing immediately. In the case of accident or unwellness, seek medical advice immediately (show directions for use or safety data sheet if possible).

Following eye contact

- Rinse for a prolonged period with plenty of water.
- Take care of doctors immediately.

Following skin contact

- Remove contaminated clothing and shoes, Rinse for a prolonged period with plenty of water.

Following inhalation

- Go to uncontaminated areas and inhale fresh air.
- Difficulty breathing, to supply oxygen.

Self-protection of the first aider

- First aider : Pay attention to self-protection!

4.2 Most important symptoms and effects, both acute and delayed : Not available

4.3 Indication of immediate medical attention and special treatment needed

- Treat depend on condition of patient.

SECTION 5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media

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Suitable extinguishing media :

- Use Powder fire extinguishers, Carbon dioxide, Water, Foam when fighting fires involving this material.

Unsuitable extinguishing media :

- Not available.

5.2 Special hazards arising from the substance or mixture

- Thermal decomposition products : Carbon oxide, Hydrocarbon gas.
- Fires and an explosive risk : Slightly fire risk.

5.3 Advice for firefighters

- If you can do it without the risk of fire, To move a package from the fire area round.
- After hours of the fire off, cooling water poured round package.
- Do not inhale the substance itself or the burning artifact, Standing against the wind will work.

SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Protective equipment : Use personal protective equipment, see Section 8

Emergency procedures :

- Heat, flame, a spark or other ignition source was to avoid contact with products.
- To avoid a eye contact, skin contact.

For emergency responders

- Not available

6.2 Environmental precautions

Atmosphere : Spread water for reduce the occurrence of dust.

Land : To save the acceptance region and make an embankment for further processing.

Underwater : Do not allow to enter sewerage system. Remove the products.

6.3 Methods and material for containment and cleaning up

For containment

- Not available

For Cleaning up

- Not available

Other information

- Small leak : Use the appropriate tool, Put it in a package.
- Massive leak : Remove all sources of ignition and isolate the risk area, Limited an entry.
Use the appropriate tool, Put it in a package.

6.4 Reference to other sections

See also sections 8 and 13 of the Safety Data Sheet.

SECTION 7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Protective measures :

- Avoid contact with eyes, skin and clothing.
- Wash thoroughly after handling. Use only in a well ventilated area.
- Keep package tightly closed. Avoid contact with heat, sparks and flame.

Measures to prevent fire : Not available

Measures to prevent aerosol and dust generation : Not available

Measures to protect the environment : Not available

Advice on general occupational hygiene : Not available

7.2 Conditions for safe storage, including any incompatibilities

Technical measures and storage conditions

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- Avoid direct sunlight and will be kept in cool, dry place.
- Avoid strong oxidizing agent, acid and other damage materials.

Packging materials : Not applicable

Requirements for storage rooms and vessels : Not available

7.3 Specific end use(s)

Recommendations : Not available

Industrial sector specific solutions : Not available

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Occupational Exposure limits

| Chemical Name | Korean regulation | ACGIH regulation | EU regulation | OSHA/NIOSH regulation | Biological exposure index |
|--|-------------------|------------------|----------------|-----------------------|---------------------------|
| Oligomerisation and alkylation reaction products of 2-phenylpropene and phenol | Not applicable | Not applicable | Not applicable | Not applicable | Not applicable |

8.2 Exposure controls

8.2.1 Appropriate engineering controls

Substance/mixture related measures to prevent exposure during identified uses : No specific measures

Structural measures to prevent exposure : No specific measures

Organisational measures to prevent exposure : No specific measures

Technical measures to prevent exposure :

- To install Local exhaust, process sealed ventilation system.
- To determine whether it was appropriate for the exposure standards.
- To prevent damage of the package.

8.2.2 Individual protection measures, such as personal protective equipment

Eye and face protection : Chemical Goggle.

Skin Protection : Safety shoes and clothes(chemical resistance)

Hand protection : Protective gloves(chemical resistance)

Other skin protection : Safety shoes and clothes(chemical resistance)

Respiratory Protection : Mask for organic chemical material, Air respiratory organ

Thermal hazards : Not available

8.2.3 Environmental exposure controls

Substance/mixture related measures to prevent exposure : No specific measures

Instruction measures to prevent exposure : No specific measures

Organisational measures to prevent exposure : No specific measures

Technical measures to prevent exposure : No specific measures

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Physical state : Viscous liquid

Color : Light yellowish

Odor : Not available

Melting point / Freezing point : < 0°C (Melting point)

Boiling point / initial boiling point / boiling range : > 300°C

Flammability (solid, gas) : Not available

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Lower / upper explosion limit : Not applicable

Flash point : 158°C (KTR)

Auto-ignition temperature : Not applicable

Decomposition temperature : Not applicable

pH : Not available

Kinematic viscosity : 1700 ~ 2,300cps (@25°C)

Solubility : Insoluble(water), Soluble(alcohol, ketone, toluene, xylene)

Partition coefficient n-octanol/water (log value) : Log p 3.6 ~ 6.3 (@25°C)

Vapour pressure : Not available

Density / Relative density : 1.00 ~ 1.10

Relative vapour density : Not applicable

Particle characteristics : Not available

Molecular weight : 500 ~ 1000

9.2 Other information

Not available

SECTION 10. STABILITY AND REACTIVITY

10.1 Reactivity

Not available

10.2 Chemical stability

Stable in room temperature and atmospheric pressure

10.3 Possibility of hazardous reactions

Not available

10.4 Conditions to avoid

Heat, flame, spark or other ignition source was to avoid contact with products.

10.5 Incompatible materials

Strong acid, strong oxidizing agent, halogen, flammable materials

10.6 Hazardous decomposition products

Carbon oxide, hydrocarbon gas

SECTION 11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

(a) Acute toxicity;

- Acute toxicity(Oral) : Not Classified
* LD50 > 2,000mg/kg - Rat (OECD TG 423, GLP)
- Acute toxicity(Dermal) : Not Classified
* LD50 > 2,000mg/kg - Rat (OECD TG 402, GLP)
- Acute toxicity(Inhalation:Gas) : Not applicable
* Not applicable
- Acute toxicity(Inhalation:Vapor) : Not classified
* LC50 > 4.92mg/L air-4hr-Rat (OECD TG 403, GLP)
- Acute toxicity(Inhalation:Dust,Mist) : Not available
* Not available

(b) Skin Corrosion / Irritation;

- Skin Corrosion/Irritation : Category 2
* Xi; R38 - Irritating to skin

(c) Serious Eye Damage / Irritation;

- Serious Eye Damage/Irritation : Not classified
* Not available

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(d) Respiratory sensitization;

- Respiratory sensitizer : Not available
- * Not available

(e) Skin Sensitization;

- Skin Sensitization : Category 1
- * R43 - May cause sensitisation by skin contact

(f) Carcinogenicity;

- Carcinogenicity : Not available
- * Not available

(g) Mutagenicity;

- Mutagenicity : Not available
- * Not available

(h) Reproductive toxicity;

- Reproductive toxicity : Not available
- * Not available

(i) Specific target organ toxicity(single exposure);

- Specific target organ toxicity(single exposure) : Not available
- * Not available

(j) Specific target organ toxicity(repeat exposure);

- Specific target organ toxicity(repeated exposure) : Not available
- * Not available

(k) Aspiration Hazard;

- Aspiration Hazard : Not available
- * Not available

11.2 Information on other hazards

Not available

SECTION 12. ECOLOGICAL INFORMATION

12.1 Toxicity

(a) Acute Toxicity;

- Acute toxicity (Fish) : Not classified
- * (Brachydanio rerio) 96hr-LL50 = 25.8mg/L (OECD TG 203, GLP)
- Acute toxicity (Shellfish) : Not classified
- * (Daphnia magna) 48hr-EL50 = 14mg/L (OECD TG 202, GLP)
- Acute toxicity (Marine alga) : Not classified
- * (Desmodesmus subspicatus) 72hr-EL50 > 250mg/L (OECD TG 201, GLP)

(b) Chronic toxicity;

- Chronic toxicity : Category 3

12.2 Persistence and Degradability

- Persistence : Log K_{ow} = 3.63 ~ 6.3
- Degradability : Not available

12.3 Bioaccumulative potential

- Bioaccumulation : Not available
- Biodegradation : BCF = 69 ~ 190 (OECD TG 305)

12.4 Mobility in soil

- Mobility in soil : K_{oc} = 3.24 ~ 5.90

12.5 Results of PBT and vPvB assessment

- Results of PBT and vPvB assessment : Under assessment as Persistent, Bioaccumulative and Toxic

12.6 Other adverse effects

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○ Other adverse effects : Not available

SECTION 13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product/Packaging disposal : Not available

Waste codes/ Waste designation according to LAW(2015) : 01-01-05

Waste treatment-relevant information : In the process itself was a legitimate facility or
waste disposal companies

Sewage disposal-relevant information : Not available

Other disposal recommendations : Review federal, provincial and local government requirements
prior to disposal.

SECTION 14. TRANSPORT INFORMATION

14.1 UN Number

Not applicable

14.2 UN Proper shipping name

Not applicable

14.3 Transport Hazard class

Not applicable

14.4 Packing group

Not applicable

14.5 Environmental hazards

Not applicable

14.6 Special precautions for user

in case of fire : Not applicable

in case of leakage : Not applicable

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

Not available

SECTION 15. REGULATORY INFORMATION

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

EU Regulatory Information

EU Classification :

EU CLP 2008 :

Classification : Skin Irrit. 2, Skin Sens. 1B, Aquatic Chronic 3

Hazard statement codes : H315, H317, H412

Precautionary statement codes : See section 2.

EU SVHC candidate list : Listed

Date of inclusion : 23-Jan-2024

Reason for inclusion : vPvB (Article 57e)

EU Authorisation list : Not listed

EU Restriction list : Not listed

Foreign Regulatory Information

External information :

U.S.A management information (OSHA Regulation) : Not regulated

U.S.A management information (CERCLA Regulation) : Not regulated

U.S.A management information (EPCRA 302 Regulation) : Not regulated

U.S.A management information (EPCRA 304 Regulation) : Not regulated

U.S.A management information (EPCRA 313 Regulation) : Not regulated

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Korea management information : Not regulated
Substance of Rotterdame Protocol : Not regulated
Substance of Stockholme Protocol : Not regulated
Substance of Montreal Protocol : Not regulated

15.2 Chemical safety assessment

No Chemical Safety Assessment has been carried out for this substance/mixture by the supplier.

SECTION 16. OTHER INFORMATION

Product safety data sheet for ML9 Toner prepared in accordance with Regulation (EU) 2020/878 (REACH), Annex II

16.1 Indication of changes

Date Updated : January 24, 2024

Version : Rev.(4)

16.2 Abbreviations and acronyms

ACGIH = American Conference of Government Industrial Hygienists
CLP = Classification Labelling Packaging Regulation ; Regulation (EC) No 1272/2008
CAS No. = Chemical Abstracts Service number
DMEL = Derived Minimal Effect Levels
DNEL = Derived No Effect Level
EC Number = EINECS and ELINCS Number (see also EINECS and ELINCS)
EU = European Union
IARC = International Agency for Research on Cancer
ISHL = Industrial Safety & Health Law
NIOSH = National Institute for Occupational Safety & Health
NTP = National Toxicology Program
OSHA = Occupational Safety and Health Administration
PBT = Persistent, Bioaccumulative and Toxic substance
PNEC(s) = Predicted No Effect Concentration(s)
REACH = Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 2015/830
STP = Sewage Treatment Plant
SVHC = Substances of Very High Concern
vPvB = Very Persistent and Very Bioaccumulative
UN = United Nations
MARPOL = International Convention for the Prevention of Pollution from Ships (IMO)
IBC = Intermediate Bulk Container
CERCLA = Comprehensive Environmental Response, Compensation & Liability Act (US)
EPCRA = Emergency Planning and Community Right-to-Know Act (US)
EINECS = European Inventory of Existing Commercial chemical Substances
ELINCS = European List of Notified Chemical Substances

16.3 Key literature reference and sources for data

- EU CLP : <https://echa.europa.eu/information-on-chemicals/cl-inventory-database>
- REACH information : <https://echa.europa.eu/information-on-chemicals/registered-substances>
- OECD SIDS : <http://webnet.oecd.org/hpv/ui/Search.aspx>
- NITE : <http://www.safe.nite.go.jp/ghs/list.html>
- United States National Library of Medicine : <http://chem.sis.nlm.nih.gov/chemidplus>
- ECOTOX : <http://cfpub.epa.gov/ecotox/>
- National Toxicology Program; <http://ntp.niehs.nih.gov/results/dbsearch/>
- National Chemicals Information System : <http://ncis.nier.go.kr/main.do>
- Korea Occupational Health & Safety Agency : <http://www.kosha.or.kr>

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16.4 Further information

This safety data sheet (SDS) is based on the legal provisions of the REACH Regulation, as amended. Its contents are intended as a guide to the appropriate precautionary handling of the material. It is responsibility of recipients of this SDS to ensure that the information contained therein is properly read and understood by all people who may use, handle, dispose or in any way come in contact with the product. Information and instructions provided in this SDS are based on the current stste of scientific and technical knowledge at the date of issue indicated. It should not be construed as any guaratee of technical performace, suitability for particular applications, and does not establish a legally valid contractual relationship. This version of the SDS Supersedes all previous versions.