JEONGSEOK chemical

MATERIAL SAFETY DATA SHEET

ESTONE PN Clear

Date of issue: 2013-08-16 **Revision date: 2013-08-16** **Version: R0001.0003**

1. IDENTIFICATION

A. Product name

- ESTONE PN Clear [AP-44501-0000]

B. Recommended use and restriction on use

- General use : Traffic Paint(Anti-skid)
- Restriction on use : Don't use this for other use

C. Manufacturer / Supplier / Distributor information

○ **Manufacturer information**

- Company name : Jeong Seok
- Address : 192 Wanjusandan 5ro Bongdong-eup Wanju-gun Jeollabuk-do Korea 565-904
- Dept. : R&D Department
- Telephone number : +82-63-260-2323
- Emergency telephone number : +82-63-260-2323
- Fax number : +82-63-260-3577
- E-mail address :

○ **Supplier/Distributer information**

- Company name : Jeong Seok
- Address : 192 Wanjusandan 5ro Bongdong-eup Wanju-gun Jeollabuk-do Korea 565-904
- Dept. : R&D Department
- Telephone number : +82-63-260-2323
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- Fax number : +82-63-260-3577
- E-mail address :

2. HAZARD IDENTIFICATION

A. GHS Classification

- Acute toxicity (oral) : Category4
- Acute toxicity (dermal) : Category3
- Acute toxicity (inhalation: vapor) : Category3
- Chronic aquatic toxicity : Category2
- Carcinogenicity : Category2
- Reproductive toxicity : Category1B
- Germ cell mutagenicity : Category2
- Serious eye damage/irritation : Category1
- Flammable liquids : Category2
- Skin corrosion/irritation : Category1
- Aspiration hazard : Category1

B. GHS label elements

○ **Hazard symbols**

○ **Signal words**

- Danger

○ **Hazard statements**

- H225 Highly flammable liquid and vapour
- H302 Harmful if swallowed
- H304 May be fatal if swallowed and enters airways
- H311 Toxic in contact with skin
- H314 Causes severe skin burns and eye damage
- H318 Causes serious eye damage
- H331 Toxic if inhaled
- H341 Suspected of causing genetic defects
- H351 Suspected of causing cancer
- H360 May damage fertility or the unborn child
- H411 Toxic to aquatic life with long lasting effects

○ **Precautionary statements**

1) Prevention

- P201 Obtain special instructions before use.
- P202 Do not handle until all safety precautions have been read and understood.
- P210 Keep away from heat/sparks/open flames/hot surfaces. ? No smoking.
- P233 Keep container tightly closed.
- P240 Ground/bond container and receiving equipment.
- P241 Use explosion-proof electrical/ventilating/lighting/equipment.
- P242 Use only non-sparking tools. Flammable liquids (chapter 2.6) 1, 2, 3
- P243 Take precautionary measures against static discharge.
- P260 Do not breathe dust/fume/gas/mist/vapours/spray.
- P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
- P264 Wash hands thoroughly after handling.
- P270 Do not eat, drink or smoke when using this product.
- P271 Use only outdoors or in a well-ventilated area.
- P273 Avoid release to the environment.
- P280 Wear protective gloves/protective clothing/eye protection/face protection.
- P281 Use personal protective equipment as required.

2) Response

- P301+P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
- P301+P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
- P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
- P302+P352 IF ON SKIN: Wash with plenty of soap and water.
- P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
- P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position 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.
- P310 Immediately call a POISON CENTER or doctor/physician.
- P311 Call a POISON CENTER or doctor/physician.
- P312 Call a POISON CENTER or doctor/physician if you feel unwell.
- P321 Specific treatment
- P322 Specific measures
- P330 Rinse mouth.
- P331 Do NOT induce vomiting.
- P361 Remove/Take off immediately all contaminated clothing.
- P363 Wash contaminated clothing before reuse.
- P370+P378 In case of fire: Use Suitable extinguishing media for extinction(Refer Section MSDS 5).
- P391 Collect spillage.

3) Storage

- P403+P233 Store in a well-ventilated place. Keep container tightly closed.
- P403+P235 Store in a well-ventilated place. Keep cool.
- P405 Store locked up.

4) Disposal

- P501 Dispose of contents/container in accordance with local/regional/national/international regulation

C. Other hazards which do not result in classification : (NFPA Classification)

○ **NFPA grade (0 ~ 4 level)**

- Health : 3, Flammability : 0, Reactivity : 2

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Trade names and Synonyms	CAS No.	Content(%)
Maleic anhydride, phthalic anhydride, adipic acid, ethylene glycol, diethylene glycol polymer	-	28516-30-5	60 ~ 70
Vinylbenzene	Styrene, Ethenylbenzene	100-42-5	20 ~ 30
Acrylic acid	Ethene carboxylic acid	79-10-7	1 ~ 10
Secret	Secret	-	0 ~ 1

4. FIRST AID MEASURES

A. Eye contact

- Do not rub your eyes.
- Immediately flush eyes with plenty of water for at least 15minutes and call a doctor/physician.
- Get medical attention immediately.
- Remove contact lenses if worn.

B. Skin contact

- Flush skin with plenty of wter for at least 15 minutes while removing contaminated clothing and shoes.
- Laundering enough contaminated clothing before reuse.
- Get medical attention immediately.
- Prevent the spread of the skin.
- Remove contaminated clothing, shoes and isolate.
- Take the doctor's examination.
- Wash thoroughly after handling.
- Wear gloves when washing the patient, and please avoid contact with contaminated clothing.

C. Inhalation contact

- When exposed to large amounts of steam and mist, move to fresh air.
- Take specific treatment if needed.
- Get medical attention immediately.
- If breathing is stopped or irregular, give artificial respiration and supply oxygen.
- Take the doctor's examination.

D. Ingestion contact

- About whether I should induce vomiting Take the advice of a doctor.
- Rinse your mouth with water immediately.
- Get medical attention immediately.
- If swallowed, large amounts of water to drink and do not induce vomiting.

E. Delayed and immediate effects and also chronic effects from short and long term exposure

- Not available

F. Notes to physician

- Notify medical personnel of contaminated situations and have them take appropriate protective measures.
- If exposed or concerned, get medical attention/advice.

5. FIREFIGHTING MEASURES

A. Suitable (Unsuitable) extinguishing media

- Dry chemical, carbon dioxide, regular foam extinguishing agent, spray
- Avoid use of water jet for extinguishing

B. Specific hazards arising from the chemical

- Not available

C. Special protective actions for firefighters

- Move containers from fire area, if you can do without the risk.
- Cool containers with water until well after fire is out.
- Keep unauthorized personnel out.
- Use appropriate extinguishing measure suitable for surrounding fire.
- Wear appropriate protective equipment.
- Keep containers cool with water spray.
- Vapor or gas is burned at distant ignition sources can be spread quickly.
- The extremely low flash point made by fire-fighters may be less effective at digesting weeks.

6. ACCIDENTAL RELEASE MEASURES

A. Personal precautions, protective equipment and emergency procedures

- Wear proper personal protective apparatus as indicated in Section 8 and avoid skin contact and inhalation.
- Ventilate closed spaces before entering.
- Must work against the wind, let the upwind people to evacuate.
- Do not direct water at spill or source of leak.
- Avoid skin contact and inhalation.
- Cleanup and disposal under expert supervision is advised.
- Keep unauthorized people away,isolate hazard area and deny entry.

B. Environmental precautions

- Prevent runoff and contact with waterways, drains or sewers.
- If large amounts have been spilled, inform the relevant authorities.

C. Methods and materials for containment and cleaning up

- Large spill : Stay upwind and keep out of low areas. Dike for later disposal.
- Notification to central government, local government. When emissions at least of the standard amount
- Dispose of waste in accordance with local regulation.
- Appropriate container for disposal of spilled material collected.
- Small leak: sand or other non-combustible material, please let use absorption.
- Wipe off the solvent.
- Dike for later disposal.
- Do not use plastic containers.
- Prevent the influx to waterways, sewers, basements or confined spaces.
- Spilled material should be treated as a potential risk of waste collected.

7. HANDLING AND STORAGE

A. Precautions for safe handling

- Wash thoroughly after handling.
- Comply with all applicable laws and regulations for handling
- Get the manual before use.
- Dealing only with a well-ventilated place.
- Do not inhale the steam prolonged or repeated.
- Avoid contact with heat, sparks, flame or other ignition sources.
- Contaminated work clothing should not be allowed out of the workplace.

B. Conditions for safe storage, including any incompatibilities

- Do not apply direct heat.
- Keep in the original container.

- Please pay attention to incompatibilities materials and conditions to avoid.
- Keep sealed when not in use.
- Prevent static electricity and keep away from combustible materials or heat sources.
- By specifying a storage area for carcinogenic substances.
- Collected them in sealed containers.
- Do not eat, drink or smoke when using this product.
- Store away from water and sewer.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

A. Exposure limits

○ **ACGIH TLV**

- [Vinylbenzene] : TWA 20 ppm
- [Acrylic acid] : TWA 2 ppm
- [Secret] : TWA 5 ppm
- [Secret] : TWA 100 ppm

B. Engineering controls

- A system of local and/or general exhaust is recommended to keep employee exposures above the Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. The use of local exhaust ventilation is recommended to control emissions near the source.

C. Personal protective equipment

○ **Respiratory protection**

- Under conditions of frequent use or heavy exposure, Respiratory protection may be needed.
- Respiratory protection is ranked in order from minimum to maximum.
- Consider warning properties before use.
- Any chemical cartridge respirator with organic vapor cartridge(s).
- Any chemical cartridge respirator with a full facepiece and organic vaporcartridge(s).
- Any air-purifying respirator with a full facepiece and an organic vapor canister.
- 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.

○ **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.

○ **Hand protection**

- Wear appropriate chemical resistant glove.

○ **Skin protection**

- Wear appropriate chemical resistant protective clothing.

○ **Others**

- Not available

9. PHYSICAL AND CHEMICAL PROPERTIES

A. Appearance	
- Appearance	Liquid(Viscous liquid)
- Color	Brown
B. Odor	Unpleasant
C. Odor threshold	Not available
D. pH	Not available
E. Melting point/Freezing point	/
F. Initial Boiling Point/Boiling Ranges	100 ℃
G. Flash point	13 ℃
H. Evaporation rate	Not available
I. Flammability(solid, gas)	Not available
J. Upper/Lower Flammability or explosive limits	12.5/0.8
K. Vapour pressure	Not available

L. Solubility	Insolubility
M. Vapour density	Not available
N. Specific gravity	Not available
O. Partition coefficient of n-octanol/water	Not available
P. Autoignition temperature	280
Q. Decomposition temperature	Not available
R. Viscosity	82±5
S. Molecular weight	Not available

10. STABILITY AND REACTIVITY

A. Chemical stability

- This material is stable under recommended storage and handling conditions.

B. Possibility of hazardous reactions

- Cylinders exposed to fire may vent and release flammable gas.

C. Conditions to avoid

- Avoid contact with incompatible materials and condition.
- Avoid : Accumulation of electrostatic charges, Heating, Flames and hot surfaces
- Avoid contact with heat, sparks, flame or other ignition sources.

D. Incompatible materials

- Not available

E. Hazardous decomposition products

- May emit flammable vapour if involved in fire.

11. TOXICOLOGICAL INFORMATION

A. Information on the likely routes of exposure

○ **(Respiratory tracts)**

- May be fatal if swallowed and enters airways

○ **(Oral)**

- Harmful if swallowed

○ **(Eye·Skin)**

- Causes serious eye damage
- Causes severe skin burns and eye damage

B. Delayed and immediate effects and also chronic effects from short and long term exposure

○ **Acute toxicity**

*** Oral**

- [Vinylbenzene] : LD50 = 2650 ㎎/㎏ Rat
- [Acrylic acid] : LD50 = 193 ㎎/㎏ Rat
- [Secret] : LD50 1300 ㎎/㎏ Rat (Oral Rat LD50 1300mg/kg (3), 1348mg/kg (4), 961mg/kg (5), 1120mg/kg (6))
- [Secret] : LD50 3500 ㎎/㎏ Rat

*** Dermal**

- [Vinylbenzene] : LD50 > 5010 ㎎/㎏ Rabbit
- [Acrylic acid] : LD50 = 295 ㎎/㎏ rabbit
- [Secret] : LD50 1770 ㎎/㎏ Rabbit (1692mg/kg Rabbit(6))
- [Secret] : LD50 4350 ㎎/㎏ Rabbit

*** Inhalation**

- [Vinylbenzene] : LC50 = 11.7 ㎎/ℓ 4 hr Rat
- [Acrylic acid] : LC50 = 3.6 ㎎/ℓ 4 hr Rat
- [Secret] : dust LC50 1 ~ 5 ㎎/ℓ 4 hr
- [Secret] : Steam LC50 6700 ppm 4 hr Rat (Equivalents : 29.09 mg/L)

○ **Skin corrosion/irritation**

- Causes severe skin burns and eye damage

○ **Serious eye damage/irritation**
- Causes serious eye damage

○ **Respiratory sensitization**
- Not available

○ **Skin sensitization**
- Not available

○ **Carcinogenicity**

*** IARC**
- [Vinylbenzene] : 2B
- [Acrylic acid] : 3
- [Secret] : 3

*** OSHA**
- Not available

*** ACGIH**
- [Vinylbenzene] : A4
- [Acrylic acid] : A4
- [Secret] : A4

*** NTP**
- [Vinylbenzene] : Group B

*** EU CLP**
- Not available

○ **Germ cell mutagenicity**
- Suspected of causing genetic defects

○ **Reproductive toxicity**
- May damage fertility or the unborn child

○ **STOT-single exposure**
- Not available

○ **STOT-repeated exposure**
- Not available

○ **Aspiration hazard**
- May be fatal if swallowed and enters airways

12. ECOLOGICAL INFORMATION

A. Ecotoxicity

○ **Fish**
- [Vinylbenzene] : LC50 = 4.02 ㎎/ℓ 96 hr
- [Acrylic acid] : LC50 = 27 ㎎/ℓ 96 hr
- [Secret] : LC50 52.6 ㎎/ℓ 96 hr
- [Secret] : LC50 3.3 ㎎/ℓ 96 hr
- [Secret] : LC50 = 0.326 ㎎/ℓ 96 hr

○ **Crustaceans**
- [Vinylbenzene] : LC50 = 12.1 ㎎/ℓ 96 hr
- [Acrylic acid] : EC50 = 54 ㎎/ℓ 24 hr
- [Secret] : EC50 5 ㎎/ℓ 48 hr
- [Secret] : LC50 190 ㎎/ℓ 96 hr
- [Secret] : LC50 = 0.502 ㎎/ℓ 48 hr

○ **Algae**
- [Vinylbenzene] : EC50 = 78 ㎎/ℓ 96 hr
- [Acrylic acid] : EC50 = 0.13 ㎎/ℓ 72 hr
- [Secret] : EC50 = 0.366 ㎎/ℓ 96 hr

B. Persistence and degradability

○ **Persistence**
- [Vinylbenzene] : log Kow = 2.95
- [Secret] : log Kow 2.3
- [Secret] : log Kow = 4.68

○ **Degradability**

- Not available

C. Bioaccumulative potential

○ **Bioaccumulative potential**

- [Secret] : BCF 13.6
- [Secret] : BCF = 79.77

○ **Biodegration**

- [Vinylbenzene] : Biodegradability = 100 (%)
- [Acrylic acid] : Biodegradability = 67.8 (%)
- [Secret] : 1.9 (%)
- [Secret] : 39 (%)

D. Mobility in soil

- [Acrylic acid] : log Kow = 0.35 (10)
- [Secret] : log Kow = 3.12 (measured) (ortho), 3.2 (measured) (meta), 3.15 (measurements) (p) (5)

E. Other adverse effects

- Not available

13. DISPOSAL CONSIDERATIONS

A. Disposal methods

- Since more than two kinds of designaed waste is mixed, it is difficult to treat seperatly, then can be reduction or stabilization by incineration or similar process.
- If water separation is possible, pre-process with Water separation process.
- Dispose by incineration.
- High temperature incinerate
- After taking off organic solvents that are supposed to be recycled, incinerate the rest of them at a high degree.

B. Special precautions for disposal

- The user of this product must disposal by oneself or entrust to waste disposer or person who other's waste recycle and dispose, person who establish and operate waste disposal facilities.
- Dispose of waste in accordance with all applicable laws and regulations.

14. TRANSPORT INFORMATION

A. UN number

- 1263

B. Proper shipping name

- Paint including paint, lacquer, enamel, stain, shellac solutions, varnish, polish, liquid filler, and liquid lacquer base

C. Hazard class

- 3

D. Packing group

- I

E. Marine pollutant

- [Acrylic acid] : Applicable

F. Special precautions for user related to transport or transportation measures

- 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 : F-E (Non-water-reactive flammable liquids)
- EmS SPILLAGE SCHEDULE : S-E (Flammable liquids, floating on water)

15. REGULATORY INFORMATION

A. National and/or international regulatory information

○ **POPs Management Law**

- Not applicable

○ **Information of EU Classification**

*** Classification**

- [Vinylbenzene] : R10 Xn; R20 Xi; R36/38
- [Acrylic acid] : R10 Xn; R20/21/22 C; R35 N; R50
- [Secret] : Carc. Cat. 3; R40 T; R23/24/25 N; R51-53
- [Secret] : R10 Xn; R20/21 Xi; R38

*** Risk Phrases**

- [Vinylbenzene] : R10, R20, R36/38
- [Acrylic acid] : R10, R20/21/22, R35, R50
- [Secret] : R23/24/25, R40, R51/53
- [Secret] : R10, R20/21, R38

*** Safety Phrase**

- [Vinylbenzene] : S2, S23
- [Acrylic acid] : S1/2, S26, S36/37/39, S45, S61
- [Secret] : S1/2, S28, S36/37, S45, S61
- [Secret] : S2, S25

○ **U.S. Federal regulations**

*** OSHA PROCESS SAFETY (29CFR1910.119)**

- Not applicable

*** CERCLA Section 103 (40CFR302.4)**

- [Vinylbenzene] : 453.599 kg 1000 lb
- [Acrylic acid] : 2267.995 kg 5000 lb
- [Secret] : 45.3599 kg 100 lb

*** EPCRA Section 302 (40CFR355.30)**

- Not applicable

*** EPCRA Section 304 (40CFR355.40)**

- Not applicable

*** EPCRA Section 313 (40CFR372.65)**

- [Vinylbenzene] : Applicable
- [Acrylic acid] : Applicable
- [Secret] : Applicable

○ **Rotterdam Convention listed ingredients**

- Not applicable

○ **Stockholm Convention listed ingredients**

- Not applicable

○ **Montreal Protocol listed ingredients**

- Not applicable

16. OTHER INFORMATION

A. Reference

- The information contained herein is believed to be accurate. It is provided independently of any sale of the product for purpose of hazard communication. It is not intended to constitute performance information concerning the product. No express warranty, or implied warranty of merchantability or fitness for a particular purpose is made with respect to the product or the information contained herein.
- This Safety Data Sheet was compiled with data and information from the following sources: KOSHA, NITE, ESIS, NLM, SIDS, IPCS

B. Issue date

- 2013-08-16

C. Revision number and Last date revised

- 2 times, 2013-08-16

D. Other

- This MSDS is prepared according to the Globally Harmonized System (GHS).