Material Safety Data Sheet(MSDS)

This Material Safety Data Sheet(MSDS) has been provided

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

1. Product Name : TECTYL SAFE 46 EHC

2. Advisable use and Restriction

○ Advisable use : Fire-resistant hydraulic fluid & EHC Oil

○ Restriction :

- Do not mix the product with any other non-regulated products

3. Manufacturer information

○ Manufacture information : KOREA HOUGHTON CORPORATION 20-31, Seobunam-ro 151beon-gil, Seonjang-myeon, Asan-si, Chungnam-do, S.KOREA (+82-2-3284-3353)

○ Company : KOREA HOUGHTON CORPORATION

○ Address : 20-31, Seobunam-ro 151beon-gil, Seonjang-myeon, Asan-si, Chungnam-do, S.KOREA

○ Information service or emergency number : +82-2-3284-3353

○ Dept. responsible for information/contact number : KOREA HOUGHTON CORPORATION R&D CENTER Industrial Lubricants Team (+82-10-4939-9753)

2. HAZARD IDENTIFICATION

1. Hazard classification

- REPRODUCTIVE TOXICITY Category 3
- LONG-TERM AQUATIC HAZARD Category 2

2. Allocation label elements

○ Symbol

○ Signal word : WARNING

○ Hazard statements

H335 May cause respiratory irritation

H411 Toxic to aquatic life with long lasting effects.

○ Precautionary statements

- Prevention

P261 Avoid breathing dust/fume/ gas/mist/vapours/spray.

P271 Use only outdoors or in a well-ventilated area.

P273 Avoid release to the environment.

- Response

P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P312 Call a POISON CENTER if you feel unwell.

P391 Collect spillage.

- Storage

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

P405 Store locked up.

- Disposal

P501 Dispose of contents/container to raw

3. Other hazard information not included in hazard classification (NFPA)

※ No NFPA data of the product. thus NFPA data was described by the product component.

Chemical Name	NFPA Level		
	Health	Flamm	Reactivity
1. PHENOL, ISOPROPYLATED, PHOSPHATE (3:1)	1	1	0
2. 1,4-BIS(P-TOLYLAMINO)ANTHRAQUINONE	2	1	0
3. TOLYL TRIAZOLE	1	1	0

3. INGREDIENT INFORMATION

Components	Common name	CAS No.	PCT(W%)
1) PHENOL, ISOPROPYLATED, PHOSPHATE (3:1)	PHENOL, ISOPROPYLATED, PHOSPHATE (3:1)	68937-41-7	95.0~100.0
2) 1,4-BIS(P-TOLYLAMINO)ANTHRAQUINONE	1,4-BIS(P-TOLYLAMINO)ANTHRAQUINONE	128-80-3	0.01~1.0
3) TOLYL TRIAZOLE	TOLYL TRIAZOLE	29385-43-1	0.01~1.0

4. FIRST AID MEASURES

1. Following eye contact

- Get medical aid immediately.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.

2. Following skin contact

- Get medical aid immediately.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Launder contaminated clothing and shoes before re-use.

3. Following inhalation

- Administer oxygen if breathing is difficult.
- Give artificial respiration if victim is not breathing.
- Keep victim warm and quiet.

- Move to fresh air.
- Seek immediate medial assistance.

4. Following ingestion
   - Get medical aid immediately.
   - If unconscious but breathing, never give anything by mouth.

5. Advice to physician
   - Do not apply drugs of the adrenaline ephedrine group.
   - Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
   - Exposures require specialized first aid with contact and medical follow-up .

5. FIRE FIGHTING MEASURES

1. Suitable (and unsuitable. extinguishing media
   ○ Suitable extinguishing media
   - Regular foam., Use alcohol foam, carbon dioxide, or water spray when fighting fires involving this material., Use dry sand or earth to smother fire., Water spray., CO2., Dry chemical.

   ○ Unsuitable extinguishing media
   - High-pressure water., Direct water.

   ○ Large fire
   - Alcohol-resistant foam., CO2., Water spray/fog., Dry chemical., Excess water., Foam.

2. Special hazards arising from the substance
   ○ Pyrolytic product
   - Can decompose at high temperatures forming toxic gases.
   - Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.

   ○ Risk of fire and explosion
   - Containers may explode when heated.
   - Fire may produce irritating and/or toxic gases.
   - May ignited from heat, friction or contamination.
   - Some may burn but none ignite readily.

3. Special protective equipment for firefighters
   - Contact may cause burns to skin and eyes.
   - Dike fire-control water for later disposal; do not scatter the material.
   - Evacuate area and fight fire from a safe distance.
   - Fire involving Tanks: ALWAYS stay away from tanks engulfed in fire.
   - Fire involving Tanks: Cool containers with flooding quantities of water until well after fire is out.
   - Fire involving Tanks: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
   - Fire involving Tanks: For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn

this is impossible, withdraw from area and let fire burn.

- Fire involving Tanks: Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- Move containers from fire area if you can do it without risk.
- Rescuers should put on appropriate protective gear.
- Runoff may cause pollution.
- Substance may be transported hot.
- Substance may be transported in a molten form.

6. ACCIDENTAL RELEASE MEASURES

1. Health considerations and protective equipment
   - Clean up spills immediately, observing precautions in Protective Equipment section.
   - Cover with plastic sheet to prevent spreading.
   - Do not enter areas which have more than 23.5% oxygen in the atmosphere, without respirator or air supplied mask.
   - Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
   - Do not touch or walk through spilled material.
   - ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
   - Please note that materials and conditions to be avoided.
   - Prevent dust cloud.
   - Stop leak if you can do it without risk.
   - Ventilate the contaminated area.
2. Environmental precautions
   - Avoid release to the environment.
   - Keep out of waterways.
   - Prevent entry into waterways, sewers, basements or confined areas.
3. For cleaning up
   - Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.
   - Absorb spill with inert material (e.g., dry sand or earth), then place in a chemical waste container.
   - Absorb the liquid and scrub the area with detergent and water.
   - Collect spillage.
   - Cover powder spill with plastic sheet or tarp to minimize spreading and keep powder dry.
   - Large Spill: Dike far ahead of liquid spill for later disposal.
   - Small Spill: Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal.
   - Small Spill: Flush area with flooding quantities of water.
   - With clean shovel place material into clean, dry container and cover loosely; move containers from spill area.

7. HANDLING AND STORAGE

1. Precautions for safe handling
   - Avoid any skin and eye contact when insert undiluted solution. Wash ... thoroughly after handling.
   - Caution: Dangerous fire hazard when exposed to heat, or flame, sparks.
   - Use adequate machine for prevention when package handling.
   - Wear an appropriate Personal protection. (See Exposure Controls/Personal Protection section.)
2. Conditions for safe storage (including any incompatibilities.
   - Choose a place that can be protected from strong oxidizers and acid.
   - Drum Handling: Must work at safe place., Loading more than 3 stack is prohibited.
   - Store containers: AVOID the place where can be damage and contamination.
   - Store in a cool/low-temperature, well-ventilated {dry} place {away from heat and ignition sources}

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

1. Exposure exposure limits, Biological exposure standard :
   ※ No exposure limits and biological exposure data of the product. thus data was described

   1) PHENOL, ISOPROPYLATED, PHOSPHATE (3:1)
      ○ Other regulation (Domestic) : Not established
      ○ ACGIH : Not established
      ○ Biological standard : Not established

   2) 1,4-BIS(P-TOLYLAMINO)ANTHRAQUINONE
      ○ Other regulation (Domestic) : Not established
      ○ ACGIH : Not established
      ○ Biological standard : Not established

   3) TOLYL TRIAZOLE
      ○ Other regulation (Domestic) : Not established
      ○ ACGIH : Not established
      ○ Biological standard : Not established

2. Appropriate engineering controls
   - Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.
   - Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.
3. Personal protection
   ○ Respiratory protection
      - If high frequency of use or exposure, wear air respirator.
      - Wear breathing protection, which needs a confirmation from the Korea Occupational Safety and Health Agency.
   ○ Eye protection
      - Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

- Wear face shield to protect eyes from scattering dust or hazardous liquid.
- Wear Non-moisture permeable goggle for dust protection.

○ Hand protection

- Wear Non-moisture permeable chemical resistance protective gloves(latex, nitrile rubber, PVC) for prevent skin contact.

○ Body protection

- When contact is likely wear chemical resistant, oil and grease resistant, non-moisture permeable shoes and clothes.

9. PHYSICAL AND CHEMICAL PROPERTIES

1. Appearance : Green
2. Odour : Slight characteristic ordor
3. Odour threshold : No data available
4. pH Values : No data available
5. Melting point/freezing point : -22.5°C (Pour point)
6. Initial boiling point and boiling range : No data available
7. Flash point : 250℃ (C.O.C)
8. Evaporation rate : No data available
9. Flammability(solid, gas) : Not applicable
10. Upper/lower flammability or explosive limits : No data available
11. Solubility : No data available
12. Vapour pressure : No data available
13. Relative density : 1.13 ± 0.05(15/4°C)
14. n-octanol/water partition coefficient : No data available
15. Auto ignition temperature : No data available
16. Decomposition temperature : No data available
17. Vapor Densities : No data available
18. Viscosity : 46 ± 4.6(40°C, ㎟/s)
19. Molecular weight(mass) : No data available

10. STABILITY AND REACTIVITY

1. Stability and hazardous reactivity
   - Can decompose at high temperatures forming toxic gases.
   - Containers may explode when heated.
   - Fire may produce irritating and/or toxic gases.
   - Fire may produce irritating, corrosive and/or toxic gases.
   - May cause toxic effects if inhaled.
   - Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.
   - Some liquids produce vapors that may cause dizziness or suffocation.

- Some may burn but none ignite readily.
- Stable under normal temperatures and pressures.

2. Conditions to avoid
   - Ignition source(heat, spark, flame, etc.).
3. Incompatible materials
   - Combustibles, reducing material.
   - Irritating and/or toxic gas.
4. Hazardous decomposition products
   - Corrosive/toxic fume.
   - Irritating, corrosive and/or toxic gas.

11. TOXICOLOGICAL INFORMATION

1. Exposure route information
   ○ Following eye contact : Irritating
   ○ Following ingestion : Pathological drunkenness, Stomachache
   ○ Following inhalation : Irritating
   ○ Following skin contact : Irritating
2. Health hazard information
   ※ No data of the product. thus data was described by the product component.

   1) PHENOL, ISOPROPYLATED, PHOSPHATE (3:1)
      ○ ACUTE TOXICITY
         - Oral : Not classified / LD50 > 5000 mg/kg Rat
         - Dermal : Not classified / LD50 > 2000 mg/kg
         - Inhalation-Gases : No data available
         - Inhalation-Vapours : No data available
         - Inhalation-Dust/mist : Not classified / LC50 > 50 mg/L Rat
      ○ SKIN CORROSION/IRRITATION : Not classified / Not irritating Rabbit
      ○ SERIOUS EYE DAMAGE/EYE IRRITATION : Not classified / Not irritating Rabbit
      ○ RESPIRATORY SENSITIZATION : No data available
      ○ SKIN SENSITIZATION : Not classified / Not sensitising Guinea pig
      ○ CARCINOGENICITY : Not classified
         - Notice of Employment and Labor : Not applicable
         - IARC : Not applicable
         - OSHA : Not applicable
         - ACGIH : Not applicable
         - NTP : Not applicable
         - EU CLP : Not applicable
      ○ GERM CELL MUTAGENICITY : Not classified / Negative Chinese hamster
      ○ REPRODUCTIVE TOXICITY : Category 3

○ SPECIFIC TARGET ORGAN TOXICITY SINGLE EXPOSURE : No data available

○ SPECIFIC TARGET ORGAN TOXICITY REPEATED EXPOSURE : Not classified / Male and female reproductive performance was also adversely affected at dose levels of 100 and 400 mg/kg/day. Rat

○ ASPIRATION HAZARD : No data available

2) 1,4-BIS(P-TOLYLAMINO)ANTHRAQUINONE

○ ACUTE TOXICITY

- Oral : Not classified / LD50 3660 mg/kg Rat
- Dermal : No data available
- Inhalation-Gases : No data available
- Inhalation-Vapours : No data available
- Inhalation-Dust/mist : No data available

○ SKIN CORROSION/IRRITATION : Category 2

○ SERIOUS EYE DAMAGE/EYE IRRITATION : Category 2

○ RESPIRATORY SENSITIZATION : No data available

○ SKIN SENSITIZATION : No data available

○ CARCINOGENICITY : Not classified

- Notice of Employment and Labor : Not applicable
- IARC : Not applicable
- OSHA : Not applicable
- ACGIH : Not applicable
- NTP : Not applicable
- EU CLP : Not applicable

○ GERM CELL MUTAGENICITY : No data available

○ REPRODUCTIVE TOXICITY : No data available

○ SPECIFIC TARGET ORGAN TOXICITY SINGLE EXPOSURE : Category 3

○ SPECIFIC TARGET ORGAN TOXICITY REPEATED EXPOSURE : Not classified / Histopathological examination did not show an effect. Mouse

○ ASPIRATION HAZARD : No data available

3) TOLYL TRIAZOLE

○ ACUTE TOXICITY

- Oral : Category 4/LD 50 675 mg/kg Rat
- Dermal : No data available
- Inhalation-Gases : No data available
- Inhalation-Vapours : No data available
- Inhalation-Dust/mist : No data available

○ SKIN CORROSION/IRRITATION : Not classified / Not irritating Rabbit

○ SERIOUS EYE DAMAGE/EYE IRRITATION : Not classified / Slightly irritating Rabbit

○ RESPIRATORY SENSITIZATION : No data available

○ SKIN SENSITIZATION : Not classified / Non sensitising Guinea pig

○ CARCINOGENICITY : Not classified

- Notice of Employment and Labor : Not applicable
- IARC : Not applicable
- OSHA : Not applicable
- ACGIH : Not applicable
- NTP : Not applicable
- EU CLP : Not applicable

○ GERM CELL MUTAGENICITY : Not classified / Negative Human

○ REPRODUCTIVE TOXICITY : Not classified / Did not find any evidence of dose-related pathology in the reproductive organs. Rat

○ SPECIFIC TARGET ORGAN TOXICITY SINGLE EXPOSURE : No data available

○ SPECIFIC TARGET ORGAN TOXICITY REPEATED EXPOSURE : Not classified / Lethargy and respiratory difficulties after each dose. Rat

○ ASPIRATION HAZARD : No data available

12. ECOLOGICAL INFORMATION

1. Aquatic toxicity

1) PHENOL, ISOPROPYLATED, PHOSPHATE (3:1)

○ Fish : LC50 1.15 ㎎/ℓ 96 hr Oncorhynchus mykiss

○ Crustacea : EC50 14 ㎎/ℓ 48 hr Daphnia magna

○ Aquatic algae : No data abailable

2) 1,4-BIS(P-TOLYLAMINO)ANTHRAQUINONE

○ Fish : LC50 0.00016 ㎎/ℓ 96 hr

○ Crustacea : LC50 0.000272 ㎎/ℓ 48 hr

○ Aquatic algae : EC50 0.000249 ㎎/ℓ 96 hr

3) TOLYL TRIAZOLE

○ Fish : LC50 36.756 ㎎/ℓ 96 hr

○ Crustacea : LC50 158.021 ㎎/ℓ 48 hr

○ Aquatic algae : EC50 13.795 ㎎/ℓ 96 hr

2. Persistence and degradation

1) PHENOL, ISOPROPYLATED, PHOSPHATE (3:1)

○ Degradation : No data abailable

○ n-octanol water partition coefficient :log Kow 4.9 ~ 5.2

2) 1,4-BIS(P-TOLYLAMINO)ANTHRAQUINONE

○ Degradation : No data abailable

○ n-octanol water partition coefficient : log Kow 8.690

3) TOLYL TRIAZOLE

○ Degradation : No data abailable

○ n-octanol water partition coefficient : log Kow 1.71

3. Bioaccumulative potential

1) PHENOL, ISOPROPYLATED, PHOSPHATE (3:1)

○ Bioaccumulation : No data abailable

○ Biodegradation : No data abailable

2) 1,4-BIS(P-TOLYLAMINO)ANTHRAQUINONE

○ Bioaccumulation : No data abailable

○ Biodegradation : Not inherently biodegradable

3) TOLYL TRIAZOLE

○ Bioaccumulation : BCF 4.168

○ Biodegradation : No data abailable

4. Mobility in soil

1) PHENOL, ISOPROPYLATED, PHOSPHATE (3:1)

- No data abailable

2) 1,4-BIS(P-TOLYLAMINO)ANTHRAQUINONE

- No data abailable

3) TOLYL TRIAZOLE

- No data abailable

5. Other adverse effects

1) PHENOL, ISOPROPYLATED, PHOSPHATE (3:1)

- No data abailable

2) 1,4-BIS(P-TOLYLAMINO)ANTHRAQUINONE

- No data abailable

3) TOLYL TRIAZOLE

- No data abailable

13. DISPOSAL CONSIDERATIONS

1. Disposal methods

- Every commercial waste producer shall either treat wastes generated from his/her place of business by him/herself or commission the treatment of such wastes to a person who has license for a waste treatment business under Article 26(3), a person who recycles of such wastes under Article 44(2), a person who has installed and operates a waste disposal facility under Article 4 or 5, a person who has completed the registration of a business of discharging wastes into the sea under Article 18 of the Marine Environment Management Act

2. Precautions (including disposal of contaminated container of package.

- Dispose of contents/container to ...
- Do not allow spill material to enter sewers, storn water drains, soil, etc.
- Empty containers may explode and residues can be ignited when pressured, cut, weld, heated.

- Empty containers may rupture when pressured.
- Empty containers recycled under environmental laws.
- Wear an appropriate Personal protection. (See Exposure Controls/Personal Protection section.)

14. TRANSPORT INFORMATION

1. UN No : Not Classified
2. Proper shipping name : Not Classified
3. Class or division : Not Classified
4. Packing group : Not Classified
5. Marine pollutant : Not Classified
6. Special safety response for transportation or transportation measure :
   ○ Emergency measures in case of fire : Not Classified
   ○ Emergency measures in the effluent : Not Classified

15. REGULATORY INFORMATION

1. Occupational safety and health act
   1) PHENOL, ISOPROPYLATED, PHOSPHATE (3:1)
      - Not classified
   2) 1,4-BIS(P-TOLYLAMINO)ANTHRAQUINONE
      - Not classified
   3) TOLYL TRIAZOLE
      - Not classified

2. Toxic chemical control act
   1) PHENOL, ISOPROPYLATED, PHOSPHATE (3:1)
      - Existing Chemical Substance
   2) 1,4-BIS(P-TOLYLAMINO)ANTHRAQUINONE
      - Existing Chemical Substance
   3) TOLYL TRIAZOLE
      - Existing Chemical Substance

3. Safety Control of hazardous substances act in Korea
   Class 4 Fourth Petroleum liquids
4. Wastes Control Act in Korea
   06-03-00, waste not classified elsewhere
5. Other regulations in Korea and overseas regulations

1) PHENOL, ISOPROPYLATED, PHOSPHATE (3:1)

○ Other regulation (Domestic) : Not classified
○ National regulations : Not classified

2) 1,4-BIS(P-TOLYLAMINO)ANTHRAQUINONE

○ Other regulation (Domestic) : Not classified
○ National regulations : Not classified

3) TOLYL TRIAZOLE

○ Other regulation (Domestic) : Not classified
○ National regulations : Not classified

16. OTHER INFORMATION

1. Reference

- CCR
- Chemical Effects Information Task Group Information Research and Analysis Section Health and Safety Research Division
- ECOSAR
- Estimation Programs Interface Suite™ United States Environmental Protection Agency, Washington, DC, USA. version 4.1
- HPVIS
- HSDB
- IUCLID
- PBT profiler, Office of Chemical Safety and Pollution Prevention , U.S. Environmental Protection Agency; version 1.301
- Publication
- RTECS
- Sbornik Vysledku Toxixologickeho Vysetreni Latek A Pripravku
- Study report

2. Prepare date : 2011-06-24

3. Revised date

- Ver 1.0 2015-01-31

  Ver 2.0 2018-03-30

4. Other

fill out based on the standard of the Ministry of Employment and Laborabout data, GHS, MSDS.