Material Safety Data Sheet(MSDS)

This Material Safety Data Sheet(MSDS) has been provided

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

1. Product Name : TECTYL HF 46

2. Advisable use and Restriction

○ Advisable use : Polyol Ester Fire-resistant hydraulic fluid(HFDU)

○ 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 Technology & Management Team Young-Uk,Kwon

2. HAZARD IDENTIFICATION

1. Hazard classification

- ACUTE TOXICITY(Oral) Category 4
- SKIN CORROSION/IRRITATION Category 2
- SERIOUS EYE DAMAGE/EYE IRRITATION Category 2

2. Allocation label elements

○ Symbol

○ Signal word : WARNING

○ Hazard statements

H302 Harmful if swallowed.

H315 Causes skin irritation.

H319 Causes serious eye irritation.

○ Precautionary statements

- Prevention

P264 Wash thoroughly after handling.

P270 Do not eat drink or smoke when using this product.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

- Response

P301+P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.

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.

P321 Specific treatment (see on this label).

P330 Rinse mouth.

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.

- 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. 9-OCTADECENOIC ACID (Z)-, 2,2-DIMETHYL-1,3-PROPANEDIYL ESTER	No Data	No Data	No Data
2. 9-OCTADECENOIC ACID (Z)-, 2-ETHYL-2-[[(1-OXO-9-OCTADECENYL)OXY]METHYL]-1,3-	1	1	0
3. N-PHENYL-1-NAPHTHYLAMINE	2	1	0
4. METHYL METHACRYLATE POLYMER	1	1	0
5. Substance1	No Data	No Data	No Data
6. Substance2	3	2	1
7. Substance3	1	1	0

3. INGREDIENT INFORMATION

Components	Common name	CAS No.	PCT(W%)
1) 9-OCTADECENOIC ACID (Z)-, 2,2-DIMETHYL-1,3-PROPANEDIYL ESTER	9-OCTADECENOIC ACID (Z)-, 2,2-DIMETHYL-1,3-PROPANEDIYL ESTER	42222-50-4	60.0~70.0
2) 9-OCTADECENOIC ACID (Z)-, 2-ETHYL-2-[[(1-OXO-9-OCTADECENYL)OXY]METHYL]-1,3-PROPANEDIYL ESTER,	9-OCTADECENOIC ACID (Z)-, 2-ETHYL-2-[[(1-OXO-9-OCTADECENYL)OXY]METHYL]-1,3-PROPANEDIYL ESTER,	57675-44-2	35.0~40.0
3) N-PHENYL-1-	N-PHENYL-1-	90-30-2	0.5~2.5

NAPHTHYLAMINE	NAPHTHYLAMINE		
4) METHYL METHACRYLATE POLYMER	METHYL METHACRYLATE POLYMER	9011-14-7	0.5~2.0
5) Substance1	-	-	0.2~1.0
6) Substance2	-	-	0.01~1.0
7) Substance3	-	-	0.01~1.0

4. FIRST AID MEASURES

1. Following eye contact
   - If eye irritation persists: Get medical advice/attention.
   - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses` if present and easy to do. Continue rinsing.
   - In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
   - Seek immediate medial assistance.
2. Following skin contact
   - For hot product, immediately immerse in or flush the affected area with large amounts of cold water to dissipate heat.
   - For minor skin contact, avoid spreading material on unaffected skin.
   - IF ON SKIN: Wash with plenty of soap and water.
   - If skin irritation occurs: Get medical advice/ attention.
   - 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.
   - Remove and isolate contaminated clothing and shoes.
   - Seek immediate medial assistance.
   - Take off contaminated clothing and wash before reuse.
3. Following inhalation
   - Administer oxygen if breathing is difficult.
   - Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.
   - Give artificial respiration if victim is not breathing.
   - Keep victim warm and quiet.
   - Move to fresh air.
   - Seek immediate medial assistance.
4. Following ingestion
   - Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

- IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
- If unconscious but breathing, never give anything by mouth.
- Rinse mouth.
- Seek immediate medial assistance.

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.

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
   - During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.
   - 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.
- 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.
   - 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) 9-OCTADECENOIC ACID (Z)-, 2,2-DIMETHYL-1,3-PROPANEDIYL ESTER
      ○ Other regulation (Domestic) : Not established
      ○ ACGIH : Not established
      ○ Biological standard : Not established

   2) 9-OCTADECENOIC ACID (Z)-, 2-ETHYL-2-[[(1-OXO-9-OCTADECENYL)OXY]METHYL]-1,3-PROPANEDIYL ESTER, (Z)-
      ○ Other regulation (Domestic) : Not established
      ○ ACGIH : Not established
      ○ Biological standard : Not established

   3) N-PHENYL-1-NAPHTHYLAMINE
      ○ Other regulation (Domestic) : Not established
      ○ ACGIH : Not established
      ○ Biological standard : Not established

   4) METHYL METHACRYLATE POLYMER
      ○ Other regulation (Domestic) : Not established
      ○ ACGIH : Not established
      ○ Biological standard : Not established

   5) Substance1
      ○ Other regulation (Domestic) : Not established

○ ACGIH : Not established

○ Biological standard : Not established

6) Substance2

○ Other regulation (Domestic) : Not established

○ ACGIH : Not established

○ Biological standard : Not established

7) Substance3

○ Other regulation (Domestic) : Not established

○ ACGIH : Not established

○ Biological standard : Not established

2. Appropriate engineering controls

- Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.
- Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

3. Personal protection

○ Respiratory protection

- If high frequency of use or exposure, wear air respirator.

○ 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 : Clear Amber
2. Odour : Fatty acid odor
3. Odour threshold : No data available
4. pH Values : No data available
5. Melting point/freezing point : No data available
6. Initial boiling point and boiling range : No data available
7. Flash point : 284℃ (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 : 0.91 ± 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
   - 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.
   - During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.
   - Irritating, corrosive and/or toxic gas.

11. TOXICOLOGICAL INFORMATION

1. Exposure route information

   ○ Following eye contact : Irritating, Tear

○ Following ingestion : Bluish skin color, Effects reported in short term inhalation is the same., Liver abnormality, Pathological drunkenness, Renal abnormality, Sicchasia, Stomachache, Vomiting

○ Following inhalation : Allergic reaction, Asthma, Bluish skin color, Dizziness, Dyspnoea, Headache, Irritating, Lapse, Liver abnormality, Renal abnormality, Spasm, Stethemia

○ Following skin contact : Bluish skin color, Effects reported in other routes of exposure is the same., Irritating, Liver abnormality, Renal abnormality, Tingling sensation

2. Health hazard information

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

1) 9-OCTADECENOIC ACID (Z)-, 2,2-DIMETHYL-1,3-PROPANEDIYL ESTER

○ ACUTE TOXICITY

- Oral : No data available
- 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 / Irritating

○ SERIOUS EYE DAMAGE/EYE IRRITATION : Category 2 / Irritating

○ 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 : No data available

○ SPECIFIC TARGET ORGAN TOXICITY REPEATED EXPOSURE : No data available

○ ASPIRATION HAZARD : No data available

2) 9-OCTADECENOIC ACID (Z)-, 2-ETHYL-2-[[(1-OXO-9-OCTADECENYL)OXY]METHYL]-1,3-PROPANEDIYL ESTER, (Z)-

○ ACUTE TOXICITY

- Oral : No data available
- Dermal : No data available
- Inhalation-Gases : No data available
- Inhalation-Vapours : No data available

- Inhalation-Dust/mist : No data available

○ SKIN CORROSION/IRRITATION : No data available

○ SERIOUS EYE DAMAGE/EYE IRRITATION : No data available

○ 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 : No data available

○ SPECIFIC TARGET ORGAN TOXICITY REPEATED EXPOSURE : No data available

○ ASPIRATION HAZARD : No data available

3) N-PHENYL-1-NAPHTHYLAMINE

○ ACUTE TOXICITY

- Oral : Category 4 / LD50 1625 mg/kg Rat

○ ACUTE TOXICITY

- Dermal : Not classified / LD50 > 5000 mg/kg Rabbit
- 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 / Not irritating Rabbit

○ RESPIRATORY SENSITIZATION : No data available

○ SKIN SENSITIZATION : Category 1 / 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 Mouse

○ REPRODUCTIVE TOXICITY : No data available

○ SPECIFIC TARGET ORGAN TOXICITY SINGLE EXPOSURE : No data available

○ SPECIFIC TARGET ORGAN TOXICITY REPEATED EXPOSURE : Not classified / Delayed occurence of toxic effects was not observed. Rat

○ ASPIRATION HAZARD : No data available

4) METHYL METHACRYLATE POLYMER

○ ACUTE TOXICITY

- Oral : No data available
- 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 / Irritating

○ SERIOUS EYE DAMAGE/EYE IRRITATION : Category 2 / Irritating

○ RESPIRATORY SENSITIZATION : No data available

○ SKIN SENSITIZATION : No data available

○ CARCINOGENICITY : Not classified

- Notice of Employment and Labor : Not applicable
- IARC : 3
- 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(Respiratory tract irritation) / May cause respiratory irritation if inhaled

○ SPECIFIC TARGET ORGAN TOXICITY REPEATED EXPOSURE : No data available

○ ASPIRATION HAZARD : No data available

5) Substance1

○ ACUTE TOXICITY

- Oral : No data available
- Dermal : No data available
- Inhalation-Gases : No data available
- Inhalation-Vapours : No data available
- Inhalation-Dust/mist : No data available

○ SKIN CORROSION/IRRITATION : No data available

○ SERIOUS EYE DAMAGE/EYE IRRITATION : No data available

○ 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 : No data available

○ SPECIFIC TARGET ORGAN TOXICITY REPEATED EXPOSURE : No data available

○ ASPIRATION HAZARD : No data available

6) Substance2

○ ACUTE TOXICITY

- Oral : No data available
- 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

7) Substance3

○ ACUTE TOXICITY

- Oral : No data available
- Dermal : No data available
- Inhalation-Gases : No data available
- Inhalation-Vapours : No data available
- Inhalation-Dust/mist : No data available

○ SKIN CORROSION/IRRITATION : No data available

○ SERIOUS EYE DAMAGE/EYE IRRITATION : No data available

○ 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 : No data available

○ SPECIFIC TARGET ORGAN TOXICITY REPEATED EXPOSURE : No data available

○ ASPIRATION HAZARD : No data available

12. ECOLOGICAL INFORMATION

1. Aquatic toxicity

1) 9-OCTADECENOIC ACID (Z)-, 2,2-DIMETHYL-1,3-PROPANEDIYL ESTER

○ Fish : No data abailable

○ Crustacea : No data abailable

○ Aquatic algae : No data abailable

2) 9-OCTADECENOIC ACID (Z)-, 2-ETHYL-2-[[(1-OXO-9-OCTADECENYL)OXY]METHYL]-1,3-PROPANEDIYL ESTER, (Z)-

○ Fish : LC50 4.2 mg/L Fish

○ Crustacea : No data abailable

○ Aquatic algae : No data abailable

3) N-PHENYL-1-NAPHTHYLAMINE

○ Fish : LC50 0.44 mg/L Fish

○ Crustacea : No data abailable

○ Aquatic algae : No data abailable

4) METHYL METHACRYLATE POLYMER

○ Fish : No data abailable

○ Crustacea : No data abailable

○ Aquatic algae : No data abailable

5) Substance1

○ Fish : No data abailable

○ Crustacea : No data abailable

○ Aquatic algae : No data abailable

6) Substance2

○ Fish : No data abailable

○ Crustacea : No data abailable

○ Aquatic algae : No data abailable

7) Substance3

○ Fish : No data abailable

○ Crustacea : No data abailable

○ Aquatic algae : No data abailable

2. Persistence and degradation

1) 9-OCTADECENOIC ACID (Z)-, 2,2-DIMETHYL-1,3-PROPANEDIYL ESTER

○ Degradation : No data abailable

○ n-octanol water partition coefficient : log Kow 17.5

2) 9-OCTADECENOIC ACID (Z)-, 2-ETHYL-2-[[(1-OXO-9-OCTADECENYL)OXY]METHYL]-1,3-PROPANEDIYL ESTER, (Z)-

○ Degradation : No data abailable

○ n-octanol water partition coefficient : log Kow > 24.73

3) N-PHENYL-1-NAPHTHYLAMINE

○ Degradation : No data abailable

○ n-octanol water partition coefficient : log Kow 4.28

4) METHYL METHACRYLATE POLYMER

○ Degradation : No data abailable

○ n-octanol water partition coefficient : No data abailable

5) Substance1

○ Degradation : No data abailable

○ n-octanol water partition coefficient : log Kow 4.25

6) Substance2

○ Degradation : No data abailable

○ n-octanol water partition coefficient : No data abailable

7) Substance3

○ Degradation : No data abailable

○ n-octanol water partition coefficient : log Kow 4.33

3. Bioaccumulative potential

1) 9-OCTADECENOIC ACID (Z)-, 2,2-DIMETHYL-1,3-PROPANEDIYL ESTER

○ Bioaccumulation : No data abailable

○ Biodegradation : No data abailable

2) 9-OCTADECENOIC ACID (Z)-, 2-ETHYL-2-[[(1-OXO-9-OCTADECENYL)OXY]METHYL]-1,3-PROPANEDIYL ESTER, (Z)-

○ Bioaccumulation : No data abailable

○ Biodegradation : BOD 80 %

3) N-PHENYL-1-NAPHTHYLAMINE

○ Bioaccumulation : BCF 2730 Fish

○ Biodegradation : BOD 69 %

4) METHYL METHACRYLATE POLYMER

○ Bioaccumulation : No data abailable

○ Biodegradation : No data abailable

5) Substance1

○ Bioaccumulation : No data abailable

○ Biodegradation : No data abailable

6) Substance2

○ Bioaccumulation : No data abailable

○ Biodegradation : No data abailable

7) Substance3

○ Bioaccumulation : No data abailable

○ Biodegradation : No data abailable

4. Mobility in soil

1) 9-OCTADECENOIC ACID (Z)-, 2,2-DIMETHYL-1,3-PROPANEDIYL ESTER

- No data abailable

2) 9-OCTADECENOIC ACID (Z)-, 2-ETHYL-2-[[(1-OXO-9-OCTADECENYL)OXY]METHYL]-1,3-PROPANEDIYL ESTER, (Z)-

- No data abailable

3) N-PHENYL-1-NAPHTHYLAMINE

- Koc 1685

4) METHYL METHACRYLATE POLYMER

- No data abailable

5) Substance1

- No data abailable

6) Substance2

- No data abailable

7) Substance3

- No data abailable

5. Other adverse effects

1) 9-OCTADECENOIC ACID (Z)-, 2,2-DIMETHYL-1,3-PROPANEDIYL ESTER

- No data abailable

2) 9-OCTADECENOIC ACID (Z)-, 2-ETHYL-2-[[(1-OXO-9-OCTADECENYL)OXY]METHYL]-1,3-PROPANEDIYL ESTER, (Z)-

- No data abailable

3) N-PHENYL-1-NAPHTHYLAMINE

- No data abailable

4) METHYL METHACRYLATE POLYMER

- No data abailable

5) Substance1

- No data abailable

6) Substance2

- No data abailable

7) Substance3

- 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 raw
   - 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) 9-OCTADECENOIC ACID (Z)-, 2,2-DIMETHYL-1,3-PROPANEDIYL ESTER

- Not classified

2) 9-OCTADECENOIC ACID (Z)-, 2-ETHYL-2-[[(1-OXO-9-OCTADECENYL)OXY]METHYL]-1,3-PROPANEDIYL ESTER, (Z)-

- Not classified

3) N-PHENYL-1-NAPHTHYLAMINE

- Harmful Agents Subject to Work Environment Monitoring

4) METHYL METHACRYLATE POLYMER

- Not classified

5) Substance1

- Not classified

6) Substance2

- Not classified

7) Substance3

- Not classified

2. Toxic chemical control act

1) 9-OCTADECENOIC ACID (Z)-, 2,2-DIMETHYL-1,3-PROPANEDIYL ESTER

- Existing Chemical Substance

2) 9-OCTADECENOIC ACID (Z)-, 2-ETHYL-2-[[(1-OXO-9-OCTADECENYL)OXY]METHYL]-1,3-PROPANEDIYL ESTER, (Z)-

- Existing Chemical Substance

3) N-PHENYL-1-NAPHTHYLAMINE

- Existing Chemical Substance, Observational Chemicals

4) METHYL METHACRYLATE POLYMER

- Existing Chemical Substance

5) Substance1

- Existing Chemical Substance

6) Substance2

- Existing Chemical Substance

7) Substance3

- Existing Chemical Substance

3. Safety Control of hazardous substances act in Korea

Not classified

4. Wastes Control Act in Korea

06-03-00, waste not classified elsewhere

5. Other regulations in Korea and overseas regulations

1) 9-OCTADECENOIC ACID (Z)-, 2,2-DIMETHYL-1,3-PROPANEDIYL ESTER

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

2) 9-OCTADECENOIC ACID (Z)-, 2-ETHYL-2-[[(1-OXO-9-OCTADECENYL)OXY]METHYL]-1,3-PROPANEDIYL ESTER, (Z)-

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

3) N-PHENYL-1-NAPHTHYLAMINE

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

4) METHYL METHACRYLATE POLYMER

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

5) Substance1

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

6) Substance2

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

7) Substance3

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

16. OTHER INFORMATION

1. Reference

- CCR
- Environ Mol Mutagen 16: 272-303
- EPISUITE
- HPVIS
- HSDB
- IARC
- IUCLID
- J-CHECK
- MITI List, National Institute of Technology and Evaluation, Japan
- QSAR
- Study report

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Ver 2.0, 2012. 9. 28
Ver 3.0, 2013. 6. 6
Ver 4.0, 2014. 12. 8

4. Other

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