

Material Safety Data Sheet(MSDS)

This Material Safety Data Sheet(MSDS) has been provided

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

1. Product Name : TECTYL COOL 450

2. Advisable use and Restriction

☐ Advisable use : Water Soluble Cutting Oil

☐ Restriction :

– Do not use product for any other non-recommended purposes

3. Manufacturer information

☐ Manufacture information : Tectyl Oil & Chemicals Vina Lot C_2D_CN,
My Phuoc 3 Park,Thoi Hoa Ward, BenCat, Binh Duong Province (933854940)

☐ Company : Tectyl Oil & Chemicals Vina

☐ Address : Lot C_2D_CN, My Phuoc 3 Park,Thoi Hoa Ward, BenCat, Binh Duong Province

☐ Information service or emergency number : 933854940

☐ Dept. responsible for information/contact number : Tectyl Oil & Chemicals Vina
R&D CENTER Technology & Management Team Jeon Young Sik

2. HAZARD IDENTIFICATION

1. Hazard classification

2. Allocation label elements

☐ Symbol

☐ Signal word : NONE

☐ Hazard statements

☐ Precautionary statements

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

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

Chemical Name	NFPA Level		
	Health	Flamm	Reactivity
1. WATER	0	0	0

2. GLYCERIN	1	1	0
3. CARBOXYLIC ACIDS, DI-, C4-11	1	1	0
4. 1,2,3-BENZOTRIAZOLE	2	1	0
5. CITRIC ACID	2	0	0
6. Substance1	2	1	1
7. Substance2	0	1	0
8. Substance3	No Data	No Data	No Data
9. Substance4	No Data	No Data	No Data
10 Substance5	1	1	0
11 Substance6	2	2	0

3. INGREDIENT INFORMATION

Components	Common name	CAS No.	PCT(W%)
1) WATER	WATER	7732-18-5	50 ~ 60
2) GLYCERIN	GLYCERIN	56-81-5	1 ~ 10
3) CARBOXYLIC ACIDS, DI-, C4-11	CARBOXYLIC ACIDS, DI-, C4-11	68937-72-4	1 ~ 5
4) 1,2,3-BENZOTRIAZOLE	1,2,3-BENZOTRIAZOLE	95-14-7	1 ~ 5
5) CITRIC ACID	CITRIC ACID	77-92-9	0.1 ~ 1.0
6) Substance1	-	-	10 ~ 20
7) Substance2	-	-	10 ~ 20
8) Substance3	-	-	1 ~ 10
9) Substance4	-	-	1 ~ 5
10 Substance5	-	-	1 ~ 5
11 Substance6	-	-	0.1 ~ 1.0

4. FIRST AID MEASURES

1. Following eye contact

- Get medical aid immediately.
- In case of contact with material, immediately flush eyes with running water for at least 15 minutes.

2. Following skin contact

- Get medical aid immediately.
- In case of contact with material, immediately flush skin with running water for at least 15 minutes.
- Launder contaminated clothing and shoes before re-use.
- Remove and isolate contaminated clothing and shoes.

3. Following inhalation

- Administer oxygen if breathing is difficult.
- Give artificial respiration if victim is not breathing.
- Move to fresh air.
- Seek immediate medical 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.

5. FIRE FIGHTING MEASURES

1. Suitable (and unsuitable) extinguishing media

2. Special hazards arising from the substance

- Risk of fire and explosion
 - Containers may explode when heated.
 - Fire may produce irritating and/or toxic gases.
 - May be 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.
- 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: 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.
- Runoff may cause pollution.
- Substance may be transported hot.

6. ACCIDENTAL RELEASE MEASURES

1. Health considerations and protective equipment

- Do not enter areas which have more than 23.5% oxygen in the atmosphere, without respirator or air supplied mask.

- 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
- Prevent entry into waterways, sewers, basements or confined areas.
3. For cleaning up
- 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) WATER

- Other regulation (Domestic) : Not established
- ACGIH : Not established

☐ Biological standard : Not established

2) GLYCERIN

☐ Other regulation (Domestic) :

TWA : 5 (respirable fraction, mist)ppm;15 (total dust)mg/m³;

STEL : 20 (mist, total particulate)mg/m³;

☐ ACGIH : Not established

☐ Biological standard : Not established

3) CARBOXYLIC ACIDS, DI-, C4-11

☐ Other regulation (Domestic) : Not established

☐ ACGIH : Not established

☐ Biological standard : Not established

4) 1,2,3-BENZOTRIAZOLE

☐ Other regulation (Domestic) : Not established

☐ ACGIH : Not established

☐ Biological standard : Not established

5) CITRIC ACID

☐ Other regulation (Domestic) : Not established

☐ ACGIH : Not established

☐ Biological standard : Not established

6) Substance1

☐ Other regulation (Domestic) : Not established

☐ ACGIH : Not established

☐ Biological standard : Not established

7) Substance2

☐ Other regulation (Domestic) : Not established

☐ ACGIH : Not established

☐ Biological standard : Not established

8) Substance3

☐ Other regulation (Domestic) : Not established

☐ ACGIH : Not established

☐ Biological standard : Not established

9) Substance4

☐ Other regulation (Domestic) : Not established

☐ ACGIH : Not established

☐ Biological standard : Not established

10) Substance5

☐ Other regulation (Domestic) : Not established

☐ ACGIH : Not established

- Biological standard : Not established

11) Substance6

- 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.

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 : Transparent
2. Odour : Oil Odor
3. Odour threshold : No data available
4. pH Values : 7.7
5. Melting point/freezing point : No data available
6. Initial boiling point and boiling range : No data available
7. Flash point : Not applicable
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 : 1.0(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 : No data available
- 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.
 - May cause toxic effects if inhaled.
 - 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.
 - Irritating and/or toxic gas.

11. TOXICOLOGICAL INFORMATION

- 1. Exposure route information
 - ☐ Following eye contact : Irritating
 - ☐ Following ingestion : Diarrhea, Dizziness, Haematological disorder, Headache, Insomniac, Irritating, Paralysis, Pathological drunkenness, Pyrexia, Renal abnormality, Sicchasia, Spasm, Stomachache, Vomiting
 - ☐ Following inhalation : Cough, Dyspnoea, Irritating, Throat infection
 - ☐ Following skin contact : Allergic reaction, Irritating, Liver abnormality, Renal abnormality
 - 2. Health hazard information
 - ※ No data of the product. thus data was described by the product component.
- 1) WATER**
- ☐ ACUTE TOXICITY
 - Oral : Not classified / LD50 > 90 mL/kg
 - 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 : Not classified / Negative Salmonella typhimurium
- ☐ 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) GLYCERIN

- ☐ ACUTE TOXICITY
 - Oral : Not classified / LD50 23000 mg/kg Mouse
 - Dermal : Not classified / LD50 56750 mg/kg Guinea pig
 - Inhalation–Gases : No data available
 - Inhalation–Vapours : Not classified / LC50 > 2.75 mg/L Rat
 - Inhalation–Dust/mist : No data available
- ☐ SKIN CORROSION/IRRITATION : Not classified / Not irritating Human
- ☐ SERIOUS EYE DAMAGE/EYE IRRITATION : Not classified / Not irritating Human
- ☐ RESPIRATORY SENSITIZATION : No data available
- ☐ SKIN SENSITIZATION : Not classified / Not sensitising Human
- ☐ 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 Rat hepatocytes
- ☐ REPRODUCTIVE TOXICITY : Not classified / There was no effect noted on growth, fertility and reproductive performance through two generations. Rat
- ☐ SPECIFIC TARGET ORGAN TOXICITY SINGLE EXPOSURE : No data available

- ☐ SPECIFIC TARGET ORGAN TOXICITY REPEATED EXPOSURE : Not classified /
Absence of treatment related effects in high dose animals. Rat
- ☐ ASPIRATION HAZARD : No data available

3) CARBOXYLIC ACIDS, DI-, C4-11

- ☐ 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

4) 1,2,3-BENZOTRIAZOLE

- ☐ ACUTE TOXICITY
 - Oral : Category 4 / LD50 600 mg/kg Rat
- ☐ ACUTE TOXICITY
 - Dermal : Not classified / LD50 > 10000 mg/kg Rabbit
 - Inhalation–Gases : No data available
 - Inhalation–Vapours : No data available
 - Inhalation–Dust/mist : Not classified / LC50 > 1.5 mg/L Rat
- ☐ 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 Chinese hamster Ovary (CHO) cell
- REPRODUCTIVE TOXICITY : Not classified / The 104 week oral study of 1H-benzotriazole in mice did not find any evidence of pathology in the reproductive organs. Mouse
- SPECIFIC TARGET ORGAN TOXICITY SINGLE EXPOSURE : No data available
- SPECIFIC TARGET ORGAN TOXICITY REPEATED EXPOSURE : Not classified / No clinical symptoms Mouse
- ASPIRATION HAZARD : No data available

5) CITRIC ACID

- ACUTE TOXICITY
 - Oral : Not classified / LD50 5400 mg/kg Mouse
 - Dermal : Not classified / LD50 > 2000 mg/kg Rat
 - 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 : Category 2 / Moderate conjunctival irritation (not fully reversible within: 14 days) Rabbit
- 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 : Not classified / Negative Salmonella typhimurium
- REPRODUCTIVE TOXICITY : Not classified / No maternal toxic effects and embryonic/teratogenic effects Rat
- SPECIFIC TARGET ORGAN TOXICITY SINGLE EXPOSURE : No data available

- ☐ SPECIFIC TARGET ORGAN TOXICITY REPEATED EXPOSURE : Not classified / No effects Rat
- ☐ ASPIRATION HAZARD : No data available

6) Substance1

- ☐ ACUTE TOXICITY
 - Oral : Not classified / LD50 6400 mg/kg Rat
 - Dermal : Not classified / LD50 > 2000 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 : Not classified / Not sensitising Guinea pig
- ☐ 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 : Not classified / Negative CHO cell
- ☐ REPRODUCTIVE TOXICITY : Not classified / Lower mean number of implantation sites and litter size Rat
- ☐ SPECIFIC TARGET ORGAN TOXICITY SINGLE EXPOSURE : No data available
- ☐ SPECIFIC TARGET ORGAN TOXICITY REPEATED EXPOSURE : Not classified / Not considered significant Rat
- ☐ ASPIRATION HAZARD : No data available

7) Substance2

- ☐ ACUTE TOXICITY
 - Oral : Not classified / LD50 5700 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 : 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

8) 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

9) Substance4

☐ 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

¹⁰
) **Substance5**

☐ ACUTE TOXICITY

- Oral : Not classified / LD50 1160 mg/kg Rat
- Dermal : Not classified / LD50 > 2000 mg/kg Rat
- Inhalation–Gases : No data available
- Inhalation–Vapours : No data available
- Inhalation–Dust/mist : No data available

☐ SKIN CORROSION/IRRITATION : Category 2 / Irritating Rabbit

☐ SERIOUS EYE DAMAGE/EYE IRRITATION : Category 2 / Highly irritating Rabbit

☐ 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 : Not classified / Ambiguous Rat
- REPRODUCTIVE TOXICITY : Not classified / LOAEL 0.5 % Rat
- SPECIFIC TARGET ORGAN TOXICITY SINGLE EXPOSURE : No data available
- SPECIFIC TARGET ORGAN TOXICITY REPEATED EXPOSURE : Not classified / LOAEL 200 mg/kg Rat
- ASPIRATION HAZARD : No data available

11) Substance6

- ACUTE TOXICITY
 - Oral : Category 4 / LD50 1952 mg/kg Rat
- ACUTE TOXICITY
 - Dermal : Not classified / LD50 > 2000 mg/kg Rabbit
 - Inhalation–Gases : No data available
 - Inhalation–Vapours : Not classified / LC50 4 mg/L Rabbit
 - 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) WATER

- ☐ Fish : No data available
- ☐ Crustacea : No data available
- ☐ Aquatic algae : No data available

2) GLYCERIN

- ☐ Fish : No data available
- ☐ Crustacea : No data available
- ☐ Aquatic algae : No data available

3) CARBOXYLIC ACIDS, DI-, C4-11

- ☐ Fish : No data available
- ☐ Crustacea : No data available
- ☐ Aquatic algae : No data available

4) 1,2,3-BENZOTRIAZOLE

- ☐ Fish : No data available
- ☐ Crustacea : No data available
- ☐ Aquatic algae : No data available

5) CITRIC ACID

- ☐ Fish : LC50 > 440 mg/L Fish
- ☐ Crustacea : EC50 > 50 mg/L Aquatic invertebrates
- ☐ Aquatic algae : No data available

6) Substance1

- ☐ Fish : No data available
- ☐ Crustacea : No data available
- ☐ Aquatic algae : No data available

7) Substance2

- ☐ Fish : No data available
- ☐ Crustacea : No data available
- ☐ Aquatic algae : No data available

8) Substance3

- ☐ Fish : No data available
- ☐ Crustacea : No data available
- ☐ Aquatic algae : No data available

9) Substance4

- ☐ Fish : No data available
- ☐ Crustacea : No data available
- ☐ Aquatic algae : No data available

10) Substance5

- ☐ Fish : LC50 122 mg/L Fish
- ☐ Crustacea : EC50 68 mg/L Aquatic invertebrate

11) ☐ Aquatic algae : EC50 81 mg/L Algae
Substance6

☐ Fish : LC50 0.047 mg/kg Fish

☐ Crustacea : No data available

☐ Aquatic algae : No data available

2. Persistence and degradation

1) WATER

☐ Degradation : No data available

☐ n-octanol water partition coefficient : No data available

2) GLYCERIN

☐ Degradation : No data available

☐ n-octanol water partition coefficient : log Kow -1.75

3) CARBOXYLIC ACIDS, DI-, C4-11

☐ Degradation : No data available

☐ n-octanol water partition coefficient : log Kow 1.21

4) 1,2,3-BENZOTRIAZOLE

☐ Degradation : No data available

☐ n-octanol water partition coefficient : log Kow 1.44

5) CITRIC ACID

☐ Degradation : No data available

☐ n-octanol water partition coefficient : log Kow -1.55

6) Substance1

☐ Degradation : DOC 82 %

☐ n-octanol water partition coefficient : No data available

7) Substance2

☐ Degradation : No data available

☐ n-octanol water partition coefficient : No data available

8) Substance3

☐ Degradation : No data available

☐ n-octanol water partition coefficient : No data available

9) Substance4

☐ Degradation : No data available

☐ n-octanol water partition coefficient : No data available

10
) **Substance5**

- ☐ Degradation : No data available
- ☐ n-octanol water partition coefficient : log Kow 3.2

11
) **Substance6**

- ☐ Degradation : No data available
- ☐ n-octanol water partition coefficient : No data available

3. Bioaccumulative potential

1) **WATER**

- ☐ Bioaccumulation : No
- ☐ Biodegradation : No data available

2) **GLYCERIN**

- ☐ Bioaccumulation : No data available
- ☐ Biodegradation : Readily biodegradable

3) **CARBOXYLIC ACIDS, DI-, C4-11**

- ☐ Bioaccumulation : No data available
- ☐ Biodegradation : No data available

4) **1,2,3-BENZOTRIAZOLE**

- ☐ Bioaccumulation : No data available
- ☐ Biodegradation : No data available

5) **CITRIC ACID**

- ☐ Bioaccumulation : No data available
- ☐ Biodegradation : No data available

6) **Substance1**

- ☐ Bioaccumulation : BCF < 0.4 Fish
- ☐ Biodegradation : BOD 1.3

7) **Substance2**

- ☐ Bioaccumulation : No data available
- ☐ Biodegradation : No data available

8) **Substance3**

- ☐ Bioaccumulation : No data available
- ☐ Biodegradation : No data available

9) **Substance4**

- ☐ Bioaccumulation : No data available

☐ Biodegradation : No data available

10
) **Substance5**

☐ Bioaccumulation : BCF

☐ Biodegradation : Readily biodegradable

11
) **Substance6**

☐ Bioaccumulation : No data available

☐ Biodegradation : No data available

4. Mobility in soil

1) **WATER**

– No data available

2) **GLYCERIN**

– No data available

3) **CARBOXYLIC ACIDS, DI-, C4-11**

– No data available

4) **1,2,3-BENZOTRIAZOLE**

– Koc 145

5) **CITRIC ACID**

– No data available

6) **Substance1**

– Koc 7

7) **Substance2**

– No data available

8) **Substance3**

– No data available

9) **Substance4**

– No data available

10
) **Substance5**

– Koc 788

11
) **Substance6**

– No data available

5. Other adverse effects

1) **WATER**

– No data available

2) **GLYCERIN**

– No data available

3) **CARBOXYLIC ACIDS, DI-, C4-11**

- No data available

4) 1,2,3-BENZOTRIAZOLE

- No data available

5) CITRIC ACID

- No data available

6) Substance1

- No data available

7) Substance2

- No data available

8) Substance3

- No data available

9) Substance4

- No data available

10
) Substance5

- No data available

11
) Substance6

- No data available

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.

- Do not allow spill material to enter sewers, storm 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) WATER

- Not classified

2) GLYCERIN

- Threshold Limit Values (TLVs) chemicals

3) CARBOXYLIC ACIDS, DI-, C4-11

- Not classified

4) 1,2,3-BENZOTRIAZOLE

- Not classified

5) CITRIC ACID

- Not classified

6) Substance1

- Not classified

7) Substance2

- Not classified

8) Substance3

- Not classified

9) Substance4

- Not classified

10) Substance5

- Not classified

11) Substance6

- Not classified

2. Toxic chemical control act

1) WATER

- Existing Chemical Substance
- 2) GLYCERIN
 - Existing Chemical Substance
- 3) CARBOXYLIC ACIDS, DI-, C4-11
 - Not classified
- 4) 1,2,3-BENZOTRIAZOLE
 - Existing Chemical Substance
- 5) CITRIC ACID
 - Existing Chemical Substance
- 6) Substance1
 - Existing Chemical Substance
- 7) Substance2
 - Existing Chemical Substance
- 8) Substance3
 - Not classified
- 9) Substance4
 - Existing Chemical Substance
- 10) Substance5
 - Existing Chemical Substance
- 11) Substance6
 - Toxic Chemicals, Existing Chemical Substance

3. Safety Control of hazardous substances act in Korea

4. Wastes Control Act in Korea

06-01-02, Grinding oil, coolant

5. Other regulations in Korea and overseas regulations

1) WATER

- ☐ Other regulation (Domestic) : Not classified
- ☐ National regulations : Not classified

2) GLYCERIN

- ☐ Other regulation (Domestic) : Not classified
- ☐ National regulations : Not classified

3) CARBOXYLIC ACIDS, DI-, C4-11

- ☐ Other regulation (Domestic) : Not classified
- ☐ National regulations : Not classified

4) 1,2,3-BENZOTRIAZOLE

- ☐ Other regulation (Domestic) : Not classified
- ☐ National regulations : Not classified

5) CITRIC ACID

- ☐ Other regulation (Domestic) : Not classified
- ☐ National regulations : Not classified

6) Substance1

- ☐ Other regulation (Domestic) : Not classified
- ☐ National regulations : Not classified

7) Substance2

- ☐ Other regulation (Domestic) : Not classified
- ☐ National regulations : Not classified

8) Substance3

- ☐ Other regulation (Domestic) : Not classified
- ☐ National regulations : Not classified

9) Substance4

- ☐ Other regulation (Domestic) : Not classified
- ☐ National regulations : Not classified

10) Substance5

- ☐ Other regulation (Domestic) : Not classified
- ☐ National regulations : Not classified

11) Substance6

- ☐ Other regulation (Domestic) : Not classified
- ☐ National regulations : Not classified

16. OTHER INFORMATION

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4. Other

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