

Material Safety Data Sheet (MSDS)

Product	Kixx Hydester 46
----------------	-------------------------

Team	Date of first preparation	Date of last revision	Revision Number
Finished Lubricants R&D Team	2014-06-24	2018-01-01	3

1. Chemical Product and Company Information


- 1) Product : Kixx Hydester 46

- 2) Recommended use of the chemical and restrictions on use
 - Recommended use : Lubricants, Fire Resistant Hydraulic Oil
 - Restrictions on use : None

- 3) Manufacture/Supplier information
 - Supply company : GS Caltex Corporation
 - Address : Nonhyeon-ro 508(Yeoksam-dong), Gangnam-gu, Seoul, South Korea
 - Information service or emergency call : +82-2-1899-5145
 - Department in charge : Finished Lubricants R&D Team

2. Hazards Identification

- 1) Classification of the substance or mixture
 - Skin Corrosion/Irritation; Category 2
 - Serious Eyes Damage/Eye Irritation; Category 2
 - Skin Sensitization; Category 1

- 2) GHS labels, including precautionary statements
 - Symbol : 

 - Signal word : Danger
 - Hazard statement
 - H315 Causes skin irritation.
 - H319 Causes serious eye irritation.
 - H317 May cause an allergic skin reaction.
 - Precautionary statement
 - Prevention
 - P264 Wash ... thoroughly after handling.
 - P280 Wear protective gloves/protective clothing/eye protection/face protection.
 - P261 Avoid breathing dust/fume/gas/mist/vapours/spray.

- P272 Contaminated work clothing should not be allowed out of the workplace.
- Response
- P305+352 IF IN EYES: Wash with plenty of water/...
- P321 Specific treatment(see... on this label)
- P332+313 If skin irritation occurs: Get medical advice/attention.
- P362 Take off contaminated clothing.
- P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes.
- P337+P313 If eye irritation persists: Get medical advice/attention.
- P302+P352 IF ON SKIN: Wash with plenty of water/...
- P333+P313 If skin irritation or rash occurs: Get medical advice/attention.
- P363 Wash contaminated clothing before reuse.
- Storage
- No precautionary phrases
- Disposal
- P501 Dispose of contents/container to...

3) Other hazards which do not result in classification

Component	NFPA	Health	Fire	Reactivity
1. Trimethylolpropane Trioleate		1	1	0
2. Methyl Methacrylate, Polymerized		1	1	0
3. Phenyl-Alpha-Naphthylamine		2	1	0
4. Tricresyl Phosphate		1	1	0
5. Additive mixture (S1)		1	1	0

3. Composition and Information on Ingredients

Component	Synonyms	CAS No.	Content(%)
1. Trimethylolpropane Trioleate	2,2-bis[[[Z]-octadec-9-enoyl]oxymethyl]butyl (Z)-octadec-9-enoate	64742-54-7	93 ~98
2. Methyl Methacrylate, Polymerized	methyl 2-methylpropanoate	9011-14-7	0.5 ~ 3
3. Phenyl-Alpha-Naphthylamine	N-phenylnaphthalen-1-amine	90-30-2	0.5 ~ 2.5
4. Tricresyl Phosphate	tris(4-methylphenyl)phosphate	1330-78-5	< 1
5. Additive mixture (S1)	Not Applicable	Not Determined	< 1

4. First Aid Measures

- 1) Eye contact :
- Wash eyes thoroughly with plenty of water for at least 20 minutes.

2) Skin contact :

- Remove contaminated clothing and wash skin with plenty of soap and water.
Flush with plenty of water for 15 minutes.
Seek medical attention if ill effect or irritation develops.

3) Inhalation :

- If overcome by exposure, remove person to fresh air immediately.
- Give oxygen or artificial respiration as needed.
- Obtain emergency medical attention. Prompt action is essential.

4) Ingestion :

- Do not induce vomiting. Obtain emergency medical attention. Prompt action is essential.

5) Most important symptoms/effects, acute and delayed :

- May cause slight eye and skin irritation. Not expected to be a sensitizer.

6) First-aid treatment and information on medical doctors :

- Treat symptomatically.
Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.

5. Fire Fighting Measures

1) Recommended(or prohibited) extinguishing media

- Recommended extinguishing media :
 - Dry chemicals, CO₂, water spray, fire fighting foam
- Prohibited extinguishing media :
 - High pressure water shoot
- Large fire :
 - fire fighting foam or water spray

2) Specific hazard from chemical material

- Toxicant from combustion : Carbon oxides
- Fire and Explosion Hazards: Slight fire risk

3) Extinguishment :

- If it is not dangerous, remove containers from fire areas.
Make hills for further treatment.
avoid Inhalation of material oneself or combustion generation material
Stand against the wind and avoid lower zone.

6. Accidental Release Measures

1) Necessary actions to protect human health :

- If it is not dangerous, stop release safely, do so.

2) Necessary actions to protect the environment

– May contaminate water supplies/pollute public waters. Evacuate/limit access.

Equip responders with proper protection.

Prevent flow to sewer/public waters. Stop release. Notify fire and environmental authorities.

Restrict water use for cleanup.

3) Purification and removal methods

○ Small leak : Only authorized person can access to the hazardous and restricted areas.

Collect spills with proper containers to treat them.

Absorb spills with sand and other non-combustible materials.

○ Large leak : No data

7. Handling and Storage

1) Safety handling :

Avoid contact with skin. Use proper bonding and/or grounding procedures.

Prevent small spills and leakage to avoid slip hazard.

Material can accumulate static charges which may cause an electrical spark (ignition source).

2) Storage :

Storage in closed containers.

8. Exposure Control and Personal Protection

A. Exposure limits and biological exposure limits of chemical

1) Trimethylolpropane Trioleate

○ ACGIH : No data

○ NIOSH : No data

○ Biological exposure limits : No data

2) Methyl Methacrylate, Polymerized

○ ACGIH : No data

○ NIOSH : No data

○ Biological exposure limits : No data

3) Phenyl-Alpha-Naphthylamine

○ ACGIH : No data

○ NIOSH : No data

○ Biological exposure limits : No data

4) Tricresyl Phosphate

○ ACGIH : 0.1 mg/m³ TWA (skin)

○ NIOSH : No data

○ Biological exposure limits : No data

5) Additive mixture (S1)

○ ACGIH : No data

- NIOSH : No data
- Biological exposure limits : No data

B. Engineering management :

Ventilation equipment should be explosion-proof if explosive concentrations of dust, vapor or fume are present.

Install local ventilation system.

Comply with limits.

C. Personal protection equipment :

Respiratory protection :

If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate.

Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include if applicable. Types of respirators to be considered for this material include: Half-face filter respirator Half-face filter

Eyes protection :

Safety glasses or goggles are recommended for the eyes protection from dusts or mists.

Hands protection :

Use proper chemical resistant gloves.

Human body protection :

Use proper chemical resistant clothes.

9. Physical and Chemical Properties

- 1) Appearance : Clear, light brown liquid
- 2) Odor : a slight smell of Ester
- 3) Odor threshold : No data
- 4) pH : No data
- 5) Melting point/freezing point : $< -25^{\circ}\text{C}$
- 6) Initial boiling point or boiling range : No data
- 7) Flash point : $> 280^{\circ}\text{C}$ (C.O.C)
- 8) Evaporation rate (BuAc=1) : No data
- 9) Flammability(solid, gas) : No data
- 10) Upper/lower flammability or explosive limits : No data
- 11) Vapor pressure : < 0.1 mmHg @ 20°C

- 12) Solubility : Not soluble in Water
- 13) Vapor density : > 5 (Density of Air = 1)
- 14) Relative density : 0.92 Kg/L @ 15°C
- 15) Partition coefficient: n-octano/water : No data
- 16) Auto-ignition temperature : No data
- 17) Decomposition temperature : No data
- 18) Viscosity : 46 cSt @ 40°C
- 19) Molecular weight : No data

10. Stability and Reactivity

- 1) Chemical stability :
 - Stable at room temperature and pressure.
- 2) Toxicant generation possibility during reaction :
 - Not polymerization
- 3) Prohibited conditions :
 - Avoid heat, sparks, open flames and other ignition sources
- 4) Prohibited materials :
 - An oxidizing agent
- 5) Toxicant during decomposition :
 - Carbon oxides

11. Toxicological Information

A. Information on the likely routes of exposure

- Inhalation : May cause slight irritation
- Ingestion : May cause vomit, coughing, shortness of breath, dizziness.
- Skin contact : May cause slight skin irritation.
- Eye contact : May cause slight eye irritation.

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

- 1) Trimethylolpropane Trioleate
 - Acute oral toxicity
 - Oral : No information available
 - Dermal : No information available

- Inhalation : No information available
- Skin corrosion/irritation : No irritating (Rabbit)
- Serious eye damage/eye irritation : No irritating (Rabbit)
- Respiratory sensitization : Not determined (guinea pig)
- Skin sensitization : Not determined (guinea pig)
- Carcinogenicity : MOL, OSHA, IARC : No data
- Germ cell mutagenicity : Negative (Ames test)
- Reproductive toxicity : No data
- Specific target organ systemic toxicity(single exposure) : No data
- Specific target organ systemic toxicity(repeated exposure) : No data
- Aspiration hazard : No data

2) Methyl Methacrylate, Polymerized

- Acute oral toxicity
 - Oral : No information available
 - Dermal : No information available
 - Inhalation : No information available
- Skin corrosion/irritation : Expected to be slightly irritating (Rabbit)
- Serious eye damage/eye irritation : Expected to be slightly irritating (Rabbit)
- Respiratory sensitization : Not determined (guinea pig)
- Skin sensitization : Not determined (guinea pig)
- Carcinogenicity : MOL, OSHA, IARC : No data
- Germ cell mutagenicity : Negative (Ames test)
- Reproductive toxicity : No data
- Specific target organ systemic toxicity(single exposure) : Expected to be slightly irritating
- Specific target organ systemic toxicity(repeated exposure) : No data
- Aspiration hazard : No data

3) Phenyl-Alpha-Naphthylamine

- Acute oral toxicity
 - Oral : LD50 > 1625 mg/bw Rat
 - Dermal : No information available
 - Inhalation : No information available
- Skin corrosion/irritation : No irritating (Rabbit)
- Serious eye damage/eye irritation : No irritating (Rabbit)
- Respiratory sensitization : Not determined (guinea pig)
- Skin sensitization : Not determined (guinea pig)
- Carcinogenicity : MOL, OSHA, IARC : No data
- Germ cell mutagenicity : Negative (Ames test)
- Reproductive toxicity : No data
- Specific target organ systemic toxicity(single exposure) : No data
- Specific target organ systemic toxicity(repeated exposure) : No data
- Aspiration hazard : No data

4) Tricresyl Phosphate

- Acute oral toxicity
 - Oral : LD50 > 3000 mg/bw Rat
 - Dermal : LD50 > 1500 mg/bw Cat

- Inhalation : No information available
- Skin corrosion/irritation : No irritating (Rabbit)
- Serious eye damage/eye irritation : No irritating (Rabbit)
- Respiratory sensitization : Not determined (guinea pig)
- Skin sensitization : Not determined (guinea pig)
- Carcinogenicity : MOL, OSHA, IARC : No data
- Germ cell mutagenicity : Negative (Ames test)
- Reproductive toxicity : No data
- Specific target organ systemic toxicity(single exposure) : No data
- Specific target organ systemic toxicity(repeated exposure) : No data
- Aspiration hazard : No data

5) Additive mixture (S1)

- Acute oral toxicity
 - Oral : LD50 > 5000 mg/bw Rat
 - Dermal : No information available
 - Inhalation : LD50 > 535 mg/bw Rat
- Skin corrosion/irritation : No irritating (Rabbit)
- Serious eye damage/eye irritation : No irritating (Rabbit)
- Respiratory sensitization : Not determined (guinea pig)
- Skin sensitization : Not determined (guinea pig)
- Carcinogenicity : MOL, OSHA, IARC : No data
- Germ cell mutagenicity : Negative (Ames test)
- Reproductive toxicity : No data
- Specific target organ systemic toxicity(single exposure) : No data
- Specific target organ systemic toxicity(repeated exposure) : No data
- Aspiration hazard : No data

C. Numerical measures of toxicity(such as ATE) : No data

12. Ecological Information

A. Hazardous to the aquatic environment :

1) Trimethylolpropane Trioleate

- Fish : No data
- Crustacea : No data
- Algae : No data

2) Methyl Methacrylate, Polymerized

- Fish : No data
- Crustacea : No data
- Algae : No data

3) Phenyl-Alpha-Naphthylamine

- Fish : No data
- Crustacea : No data
- Algae : No data

4) Tricresyl Phosphate

- Fish : LC50 82 mg/l 96 hr *Lepomis macrochirus*
- Crustacea : LC50 3.2mg/l 48 hr *Daphnia magna*

Algea : EC50 1.3 mg/l 96 hr Scenedesmus pannonia

5) Additive mixture (S1)

Fish : No data

Crustacea : No data

Algea : No data

B. Persistence and degradability :

1) Trimethylolpropane Trioleate

- log Kow > 3

2) Methyl Methacrylate, Polymerized

- No data

3) Phenyl-Alpha-Naphthylamine

- log Kow > 4.2

4) Tricresyl Phosphate

- log Kow > 6.34

5) Additive mixture (S1)

- log Kow > 2.6 ~ 4.25

C. Bioaccumulative potential

1) Trimethylolpropane Trioleate

- 72.5 ~ 80 (%) 28 day

2) Methyl Methacrylate, Polymerized

- No data

3) Phenyl-Alpha-Naphthylamine

- BCF 60

4) Tricresyl Phosphate

- BCF 2534

5) Additive mixture (S1)

- BCF 2.9

D. Mobility in soil :

- No data

E. Other adverse effects :

- No data

13. Disposal Considerations

1) Disposal methods :

Use only licensed transporters and permitted facilities for waste disposal.

2) Disposal cautions :

Dispose according to the related regulations

14. Transport Information

- 1) UN number : Not applicable
- 2) UN Proper Shipping Name : Not applicable
- 3) Transport hazard classes : Not applicable
- 4) Packing group, if applicable : Not applicable
- 5) Environmental hazards : Not applicable
- 6) Special precautions for user : Not applicable

15. Regulatory Information

A. Industrial safety and health act (Korea)

Occupation environment measurement material, Special health examination material, Threshold

B. Chemical control act (Korea)

- Trimethylolpropane Trioleate : No data
- Methyl Methacrylate, Polymerized : No data
- Phenyl-Alpha-Naphthylamine : No data
- Tricresyl Phosphate : No data
- Additive mixture (S1) : No data

C. Wastes control act (Korea)

- Trimethylolpropane Trioleate : No data
- Methyl Methacrylate, Polymerized : No data
- Phenyl-Alpha-Naphthylamine : No data
- Tricresyl Phosphate : No data
- Additive mixture (S1) : No data

D. Hazardous material safety act (Korea)

- Trimethylolpropane Trioleate : No data
- Methyl Methacrylate, Polymerized : No data
- Phenyl-Alpha-Naphthylamine : No data
- Tricresyl Phosphate : No data
- Additive mixture (S1) : No data

E. Other internal and foreign acts

1) Trimethylolpropane Trioleate

EU classification

- Classification : Not determined
- Risk Phrases : Not determined
- Safety Phrases : Not determined

U.S. acts

- OSHA (29CFR1910.119) : Not determined

- CERCLA 103 (40CFR302.4) : Not determined
- EPCRA 302 (40CFR355.30) : Not determined
- EPCRA 304 (40CFR355.40) : Not determined
- EPCRA 313 (40CFR372.65) : Not determined

2) Methyl Methacrylate, Polymerized

EU classification

- Classification : Not determined
- Risk Phrases : Not determined
- Safety Phrases : Not determined

U.S. acts

- OSHA (29CFR1910.119) : Not determined
- CERCLA 103 (40CFR302.4) : Not determined
- EPCRA 302 (40CFR355.30) : Not determined
- EPCRA 304 (40CFR355.40) : Not determined
- EPCRA 313 (40CFR372.65) : Not determined

3) Phenyl-Alpha-Naphthylamine

EU classification

- Classification : Not determined
- Risk Phrases : Not determined
- Safety Phrases : Not determined

U.S. acts

- OSHA (29CFR1910.119) : Not determined
- CERCLA 103 (40CFR302.4) : Not determined
- EPCRA 302 (40CFR355.30) : Not determined
- EPCRA 304 (40CFR355.40) : Not determined
- EPCRA 313 (40CFR372.65) : Not determined

4) Tricresyl Phosphate

EU classification

- Classification : Not determined
- Risk Phrases : Not determined
- Safety Phrases : Not determined

- U.S. acts
 - OSHA (29CFR1910.119) : Not determined
 - CERCLA 103 (40CFR302.4) : Not determined
 - EPCRA 302 (40CFR355.30) : Not determined
 - EPCRA 304 (40CFR355.40) : Not determined
 - EPCRA 313 (40CFR372.65) : Not determined

5) Additive mixture (S1)

- EU classification
 - Classification : Not determined
 - Risk Phrases : Not determined
 - Safety Phrases : Not determined
- U.S. acts
 - OSHA (29CFR1910.119) : Not determined
 - CERCLA 103 (40CFR302.4) : Not determined
 - EPCRA 302 (40CFR355.30) : Not determined
 - EPCRA 304 (40CFR355.40) : Not determined
 - EPCRA 313 (40CFR372.65) : Not determined

16. Other Information

1) References

- Korea Occupational Safety & Health Agency
- GS Caltex R&D Center
- MSDS of raw material from supplier
- KOSHANET
- Occupation safety and health acts of Korea
- Globally Harmonized System of classification and labeling of chemicals (GHS), First revised edition, United Nations
- EINECS(European Inventory of Existing Commercial Chemical Substances)
- ACGIH(American Conference of Governmental Safety and Health)
- IUCLID Dataset

2) Date of preparation of the first version of the MSDS : 2014.06.24

3) Revised frequency and Date of preparation of the latest version of the MSDS : 2018-01-01 (3)

4) Others :

To the best of our knowledge, the information provided in this MSDS document is correct. Access to this information is being provided via the Internet so that it can be made available to as many potential users as possible. We do not assume any liability for consequences of the use of this information since it may be applied under conditions beyond our control or knowledge. Also, it is possible that additional data could be made available after this MSDS was issued.

Certain hazards are described herein, however these may not be the only hazards that exist. All materials may present unknown hazards and should be used with caution.

Customers are encouraged to review this information, follow precautions, and comply with all applicable laws and regulations regarding the use and disposal of this product.

For specific technical data or advice concerning this product as supplied in your country please contact your local sales representative.

The final determination of the suitability of any material is the sole responsibility of the user.