Material Safety Data Sheet

Product	Kixx Grease Liplex 2		
List No.	Issuing date	Last revised date	Department
LB3017	2012-11-30	2018-01-01	Finished Lubricants R&D Team

1. Identification of the substance/mixture and of the company/undertaking

1) Product identifier

- Kixx Grease Liplex 2

2) Relevant identified uses of the substance or mixture and uses advised against

- Relevant identified uses : (Lubricants and additives)
- Uses advised against : Do not use for any other purpose.

3) Supplier information

○ **Manufacturer information**

- Company name [Manufacture] : GS Caltex Corporation
- Address : GS Tower, 508, Nonhyeon-ro, Gangnam-gu, Seoul, Korea
- Emergency telephone number : 1899-5145

2. HAZARD IDENTIFICATION

1) Hazard classification

- Not applicable

2) Allocation label elements

○ **Hazard pictograms**

- Not applicable

○ **Signal word**

- Not applicable

○ **Hazard statements**

- Not applicable

○ **Precautionary statements**

1) Prevention

- Not applicable

2) Response

- Not applicable

3) Storage

- Not applicable

4) Disposal

- Not applicable

3) Other hazards

○ **Product NFPA Level : Health , Flammability , Reactivity**

(※ 0-Lack, 1-Low, 2-Moderate, 3-High, 4-Very High)

※ Chemical NFPA Level.

- Distillates (petroleum), hydrotreated heavy paraffinic : Health=1, Flammable=1, Reaction=0
- Distillates, petroleum, solvent-refined heavy naphthenic : Health=1, Flammable=1, Reaction=0
- 12-Hydroxystearic acid : Health=1, Flammable=1, Reaction=0
- Animal oils mixed with animal oil Me esters, sulfurized : Health=0, Flammable=0, Reaction=0
- Azelaic acid : Health=1, Flammable=1, Reaction=0
- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : Health=1, Flammable=1, Reaction=0
- Animal oils mixed with vegetable oils, sulfurized : Health=1, Flammable=1, Reaction=0
- Business Secret1 : Health=1, Flammable=1, Reaction=0
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Health=0, Flammable=1, Reaction=0

3. Composition/Information on ingredients

Chemical name	Trade names and Synonyms	CAS No.	EC No.	Contain Ratio(%)
Distillates (petroleum), hydrotreated heavy paraffinic		64742-54-7	265-157-1	60 ~ 70
Distillates, petroleum, solvent-refined heavy naphthenic		64741-96-4	265-097-6	10 ~ 20
12-Hydroxystearic acid		106-14-9	203-366-1	5 ~ 10
Animal oils mixed with animal oil Me esters, sulfurized		68990-80-7	273-625-1	1 ~ 5
Azelaic acid		123-99-9	204-669-1	1 ~ 5
Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts		68649-42-3	272-028-3	1 ~ 5
Animal oils mixed with vegetable oils, sulfurized		68991-19-5	273-639-8	1 ~ 5
Business Secret1				3 ~ 6
N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene		68411-46-1	270-128-1	0 ~ 1

4. FIRST AID MEASURES

1) Following eye contact

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

2) Following skin contact

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

3) Following inhalation

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

4) Following ingestion

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

5) Advice to physician

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Do not apply drugs of the adrenaline ephedrine group.

5. FIRE FIGHTING MEASURES

1) Suitable (and unsuitable) extinguishing media

○ **Suitable extinguishing media**

- Small fire: Dry sand, dry chemical, alcohol-resistant foam, water spray, regular foam, CO2 (Suitable extinguishing media).
- Large fire: Water spray/fog, regular foam (Suitable extinguishing media).

○ **Unsuitable extinguishing media**

- High-pressure water (Unsuitable extinguishing media).

2) Special hazards arising from the substance or mixture

- May ignited from heat, friction or contamination.
- Containers may explode when heated.
- Some may burn but none ignite readily.
- Fire may produce irritating and/or toxic gases.
- May cause toxic effects if inhaled.
- Some liquids produce vapors that may cause dizziness or suffocation.
- May ignited from heat, friction or contamination.
- Containers may explode when heated.
- Some may burn but none ignite readily.
- Fire may produce irritating and/or toxic gases.
- May cause toxic effects if inhaled.
- Some liquids produce vapors that may cause dizziness or suffocation.

3) Special protective equipment for firefighters

- Substance may be transported hot.
- Runoff may cause pollution.
- Contact may cause burns to skin and eyes.
- Dike fire-control water for later disposal; do not scatter the material.
- Move containers from fire area if you can do it without risk.
- 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.
- Fire involving Tanks: ALWAYS stay away from tanks engulfed in fire.

6. ACCIDENTAL RELEASE MEASURES

1) Health considerations and protective equipment

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- Stop leak if you can do it without risk.
- Please note that materials and conditions to be avoided.
- Ventilate the contaminated area.
- Do not touch or walk through spilled material.
- Prevent dust cloud.
- Do not enter areas which have more than 23.5% oxygen in the atmosphere, without respirator or air supplied mask.

2) Environmental precautions

- Prevent entry into waterways, sewers, basements or confined areas.

3) For cleaning up

- Small Spill: Flush area with flooding quantities of water.
- Small Spill: Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal.
- Large Spill: Dike far ahead of liquid spill for later disposal.
- With clean shovel place material into clean, dry container and cover loosely; move containers from spill area.
- Cover powder spill with plastic sheet or tarp to minimize spreading and keep powder dry.

7. HANDLING AND STORAGE

1) Precautions for safe handling

- Please note that materials and conditions to be avoided.
- Wash ... thoroughly after handling.
- Handling refer to engineering control/personal protection section.
- CAUTION: High temperature.
- CAUTION: This material does not contain oxygen and may cause asphyxia if released in a confined area.
- High concentration of this gas will create an oxygen-deficient atmosphere, creating the risk of asphyxiation. Check oxygen content before entering area.
- CAUTION: Vapors displace air and can cause asphyxiation in confined spaces if released material.
- CAUTION: Can be reach toxic concentration quickly in air if released.
- Do not spray. Can be reach toxic concentration quickly in air if sprayed.
- Keep under 20℃. This material evaporate slowly at 20℃ and reach toxic concentration.
- Do not spray. This material does not easily evaporated. But can be reach toxic concentration quickly in air if sprayed.
- Check oxygen content before entering area.
- Do not spray. Can be evaporate quickly if sprayed.
- Use adequate machine for prevention when package 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.
- Wear an appropriate Personal protection. (See Exposure Controls/Personal Protection section.)

2) Conditions for safe storage (including any incompatibilities)

- Store in a dry place. Store in a closed container.
- Please note that materials and conditions to be avoided.
- 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}
- 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.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

1) Chemical exposure limits, Biological exposure standard

○ Occupational exposure limits (Domestic)

- Distillates (petroleum), hydrotreated heavy paraffinic : TWA Not applicable, STEL Not applicable
- Distillates, petroleum, solvent-refined heavy naphthenic : TWA Not applicable, STEL Not applicable
- 12-Hydroxystearic acid : TWA Not applicable, STEL Not applicable
- Animal oils mixed with animal oil Me esters, sulfurized : TWA Not applicable, STEL Not applicable
- Azelaic acid : TWA Not applicable, STEL Not applicable
- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : TWA Not applicable, STEL Not applicable
- Animal oils mixed with vegetable oils, sulfurized : TWA Not applicable, STEL Not applicable
- Business Secret1 : TWA Not applicable, STEL Not applicable
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : TWA Not applicable, STEL Not applicable

○ Occupational exposure limits (ACGIH)

- Distillates (petroleum), hydrotreated heavy paraffinic : TWA 5mg/m3, STEL Not applicable
- Distillates, petroleum, solvent-refined heavy naphthenic : TWA 5mg/m3, STEL Not applicable
- 12-Hydroxystearic acid : TWA Not applicable, STEL Not applicable
- Animal oils mixed with animal oil Me esters, sulfurized : TWA Not applicable, STEL Not applicable
- Azelaic acid : TWA Not applicable, STEL Not applicable
- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : TWA Not applicable, STEL Not applicable
- Animal oils mixed with vegetable oils, sulfurized : TWA Not applicable, STEL Not applicable
- Business Secret2 : TWA 5mg/m3, STEL Not applicable
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : TWA Not applicable, STEL Not applicable

○ Biological limit values

- Distillates (petroleum), hydrotreated heavy paraffinic : Not applicable
- Distillates, petroleum, solvent-refined heavy naphthenic : Not applicable
- 12-Hydroxystearic acid : Not applicable
- Animal oils mixed with animal oil Me esters, sulfurized : Not applicable
- Azelaic acid : Not applicable
- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : Not applicable
- Animal oils mixed with vegetable oils, sulfurized : Not applicable
- Business Secret3 : Not applicable
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Not applicable

2) Appropriate engineering controls

- Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

3) Personal protection equipment

○ **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**

- Wear suitable protective goggles and face shields.
- Wear face shield to protect eyes from scattering dust or hazardous liquid.
- Wear Non-moisture permeable goggle for dust protection.
- Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

○ **Hand protection**

- Wear insulated gloves.
- 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

Item	Input Value
Apperance	Clear, light yellow semi-solid
Smell	a specific smell of Hydrocarbon
Smell Threshold	No Data
pH	No Data
Melting/Freezing Poing	No Data
Boilling Point	No Data
Flash Point	No Data
Evaporating Rate	No Data
Flammability	No Data
Explosibility Range	No Data
Steam Pressure	<0.1 kPa (at 20℃)
Solubility	No Data
Vapor Density	No Data
Specific Gravity	0.901
Distribution Coefficient	No Data
SelfIgnition Temperature	No Data
Pyrolysis Temperature	No Data
Viscosity	No Data
Molecular Weight	No Data

10. STABILITY AND REACTIVITY

1) Stability and hazardous reactivity

- Stable under normal temperatures and pressures.
- Containers may explode when heated.
- Some may burn but none ignite readily.
- Fire may produce irritating and/or toxic gases.
- May cause toxic effects if inhaled.
- Some liquids produce vapors that may cause dizziness or suffocation.

2) Conditions to avoid

- Ignition source(heat, spark, flame, etc.).

3) Incompatible materials

- Combustibles.
- Irritating and/or toxic gas.

4) Hazardous decomposition products

- Not available

11. TOXICOLOGICAL INFORMATION

1) Exposure route information

○ **Inhalation**

- After inhalation: No data

○ **Skin Contact**

- Following skin contact: No data

○ **Eye Contact**

- After eye contact: No data

○ **Ingestion**

- After ingestion: No data

2) Health hazard information

○ **Acute toxicity**

*** Oral - PRODUCT : Not applicable (ATEMix > 2,000 mg/kg)**

- Distillates (petroleum), hydrotreated heavy paraffinic : LD50 >15000 ㎎/kg Species : Rat
- Distillates, petroleum, solvent-refined heavy naphthenic : LD50 >5000 ㎎/kg (Rat)
- 12-Hydroxystearic acid : LD50 > 10000 mg/L (Rat)
- Animal oils mixed with animal oil Me esters, sulfurized : No data
- Azelaic acid : LD50 >5000 ㎎/kg (Rat)
- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : No data
- Animal oils mixed with vegetable oils, sulfurized : No data
- Business Secret1 : LD50 >5000 ㎎/kg (Rat)
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : LD50 >5000 ㎎/kg Species : Rat (bw OECD401)

*** Dermal - PRODUCT : Not applicable (ATEMix > 2,000 mg/kg)**

- Distillates (petroleum), hydrotreated heavy paraffinic : LD50 >5000 ㎎/㎏ Species : Rabbit
- Distillates, petroleum, solvent-refined heavy naphthenic : LD50 >2000 ㎎/㎏ (Rabbit)
- 12-Hydroxystearic acid : No data
- Animal oils mixed with animal oil Me esters, sulfurized : No data
- Azelaic acid : LD50 >10000 ㎎/㎏ (Rat)
- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : No data
- Animal oils mixed with vegetable oils, sulfurized : No data
- Business Secret1 : LD50 > 2000 mg/kg (Rabbit)
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : LD50 >2000 ㎎/㎏

*** Inhalation(Gas) - PRODUCT : Not applicable**

- Distillates (petroleum), hydrotreated heavy paraffinic : No data
- Distillates, petroleum, solvent-refined heavy naphthenic : No data
- 12-Hydroxystearic acid : No data
- Animal oils mixed with animal oil Me esters, sulfurized : No data
- Azelaic acid : No data
- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : No data
- Animal oils mixed with vegetable oils, sulfurized : No data
- Business Secret1 : No data
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : No data

*** Inhalation(Vapour) - PRODUCT : Not applicable (ATEMix > 20 mg/L)**

- Distillates (petroleum), hydrotreated heavy paraffinic : No data
- Distillates, petroleum, solvent-refined heavy naphthenic : LC50> 5.53 mg/l air/4h (rat; female/male; aerosol inlahation; no deaths; OECD Guideline 403; 1988)
- 12-Hydroxystearic acid : No data
- Animal oils mixed with animal oil Me esters, sulfurized : No data
- Azelaic acid : No data
- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : No data
- Animal oils mixed with vegetable oils, sulfurized : No data
- Business Secret1 : No data
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : No data

*** Inhalation(Dust, mist) - PRODUCT : Not applicable (ATEMix > 5 mg/L)**

- Distillates (petroleum), hydrotreated heavy paraffinic : LC50 > 5.53 mg/L 4h Rat
- Distillates, petroleum, solvent-refined heavy naphthenic : LC50 > 5.53 mg/L 4h Rat
- 12-Hydroxystearic acid : No data
- Animal oils mixed with animal oil Me esters, sulfurized : No data
- Azelaic acid : No data
- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : No data
- Animal oils mixed with vegetable oils, sulfurized : No data
- Business Secret1 : LC50 > 5.53 mg/L 4h Rat
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : No data

○ Skin corrosion/Irritation

- Distillates (petroleum), hydrotreated heavy paraffinic : Rabbit - slightly irritating
- Distillates, petroleum, solvent-refined heavy naphthenic : Slightly irritating(rabbit)
- 12-Hydroxystearic acid : Rabbit, non-irritating
- Animal oils mixed with animal oil Me esters, sulfurized : No data
- Azelaic acid : Rabbit; slightly irritating(24hr)
- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : Irritating
- Animal oils mixed with vegetable oils, sulfurized : No data
- Business Secret1 : severe irritating(rabbit)
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : No data

○ Serious eye damage/irritation

- Distillates (petroleum), hydrotreated heavy paraffinic : Rabbit, not irritating, OECD TG 405 GLP (Read-across CAS No. 64742-53-6)
- Distillates, petroleum, solvent-refined heavy naphthenic : Rabbit, non-irritating
- 12-Hydroxystearic acid : Rabbit, non-irritating
- Animal oils mixed with animal oil Me esters, sulfurized : No data
- Azelaic acid : Rabbit; slightly irritating(24hr)
- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : Rabbit - irritating (OECD 405, GLP)
- Animal oils mixed with vegetable oils, sulfurized : No data
- Business Secret1 : Skin irritation substance
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : No data

○ Respiratory sensitization

- Distillates (petroleum), hydrotreated heavy paraffinic : No data
- Distillates, petroleum, solvent-refined heavy naphthenic : No data
- 12-Hydroxystearic acid : No data
- Animal oils mixed with animal oil Me esters, sulfurized : No data
- Azelaic acid : No data
- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : Not sensitising (Guinea pig)
- Animal oils mixed with vegetable oils, sulfurized : No data
- Business Secret1 : No data
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : No data

○ Skin sensitization

- Distillates (petroleum), hydrotreated heavy paraffinic : Not sensitising (Guinea Pig)
- Distillates, petroleum, solvent-refined heavy naphthenic : Not sensitising (Guinea Pig)
- 12-Hydroxystearic acid : Not sensitising (Guinea Pig)
- Animal oils mixed with animal oil Me esters, sulfurized : No data
- Azelaic acid : No data
- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : Not sensitising (Guinea pig)
- Animal oils mixed with vegetable oils, sulfurized : No data
- Business Secret1 : Not sensitising (Guinea Pig)

- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Not sensitising (Guinea pig, maximization test; OECD 406 GLP)

○ Carcinogenicity

- Distillates (petroleum), hydrotreated heavy paraffinic : EU CLP:1B The classification as a carcinogen need not apply if it can be shown that the sybstance contains less than 3% DMSO extract as measure by IP 346

- Distillates, petroleum, solvent-refined heavy naphthenic : EU CLP:1B The classification as a carcinogen need not apply if it can be shown that the sybstance contains less than 3% DMSO extract as measure by IP 346

- 12-Hydroxystearic acid : No data

- Animal oils mixed with animal oil Me esters, sulfurized : No data

- Azelaic acid : No data

- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : No data

- Animal oils mixed with vegetable oils, sulfurized : No data

- Business Secret1 : EU CLP:1B The classification as a carcinogen need not apply if it can be shown that the sybstance contains less than 3% DMSO extract as measure by IP 346

- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : No data

○ Germ cell mutagenicity

- Distillates (petroleum), hydrotreated heavy paraffinic : CHO cell - Negative

- Distillates, petroleum, solvent-refined heavy naphthenic : In vitro- Negative (Bacterial Reverse Mutation Assay; OECD TG 471)

- 12-Hydroxystearic acid : In vitro chinese hamster Ovary : negative

- Animal oils mixed with animal oil Me esters, sulfurized : No data

- Azelaic acid : No data

- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : No data

- Animal oils mixed with vegetable oils, sulfurized : No data

- Business Secret1 : Mouse lymphoma cell; negative

- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : In Vitro - Bacterial reverse mutation test : negative (HPVIS), In vivo - Chromosome aberration test (Mouse Bone marrow cell) : negative

○ Reproductive toxicity

- Distillates (petroleum), hydrotreated heavy paraffinic : Reproductive performance was not adversely affected at any dose level evaluated. (Rat)

- Distillates, petroleum, solvent-refined heavy naphthenic : Rat; Reproductive performance was not adversely affected at any dose level evaluated. There were no neonatal toxicity observed at any dose level. NOAEL(F1, P)>=1000mg/kg bw/day(OECD Guideline 421; rea

- 12-Hydroxystearic acid : No data

- Animal oils mixed with animal oil Me esters, sulfurized : No data

- Azelaic acid : No data

- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : No data

- Animal oils mixed with vegetable oils, sulfurized : No data

- Business Secret1 : Rat; No reproductive toxicity observed.

- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Treatment-related effects on reproduction were observed at 600 mg/kg/day. These were confined to an increase in pre-implantation losses, resulting in lower offspring numbers at this dose level. NOAEL(

○ Specific target organ toxicity (single exposure)

- Distillates (petroleum), hydrotreated heavy paraffinic : No systemic effects were observed

- Distillates, petroleum, solvent-refined heavy naphthenic : No data

- 12-Hydroxystearic acid : Rat; significant effects not observed

- Animal oils mixed with animal oil Me esters, sulfurized : No data

- Azelaic acid : No data

- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : Respiratory tract irritation

- Animal oils mixed with vegetable oils, sulfurized : No data

- Business Secret1 : No data

- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : No data

○ Specific target organ toxicity (repeated exposure)

- Distillates (petroleum), hydrotreated heavy paraffinic : No systemic effects were observed

- Distillates, petroleum, solvent-refined heavy naphthenic : In a 90-day dermal toxicity study, mineral oil basestock was applied to the intact, shaved skin of Sprague-Dawley rats (10/sex/dose) for 13 weeks. No systemic or local effects were considered signific

- 12-Hydroxystearic acid : Rat; Treatment-related effects were not observed.

- Animal oils mixed with animal oil Me esters, sulfurized : No data

- Azelaic acid : No data

- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : No data

- Animal oils mixed with vegetable oils, sulfurized : No data

- Business Secret1 : LOAEL 125 mg/kg Rat

- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : The hepatic changes observed were regarded as adaptive in nature. The NOEL for systemic toxicity was therfore considered to be 5 mg/kg/day. (Rat both M/F; Oral Gavage 43-54d; OECD 422 GLP read across

○ Aspiration hazard

- Distillates (petroleum), hydrotreated heavy paraffinic : No data

- Distillates, petroleum, solvent-refined heavy naphthenic : 1.99 mm2/s ~ 847 mm2/s (40°C)(EN ISO 3104/ASTM D 445; 2010)

- 12-Hydroxystearic acid : No data

- Animal oils mixed with animal oil Me esters, sulfurized : No data

- Azelaic acid : No data

- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : No data

- Animal oils mixed with vegetable oils, sulfurized : No data

- Business Secret1 : No data

- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : No data

12. ECOLOGICAL INFORMATION

1) Aquatic toxicity

○ Fish

- Distillates (petroleum), hydrotreated heavy paraffinic : LC50 > 100 mg/L Fish(Pimephales promelas)

- Distillates, petroleum, solvent-refined heavy naphthenic : LC50 >5000 ㎎/ℓ 96 hr Oncorhynchus mykiss

- 12-Hydroxystearic acid : LC50 > 1000 mg/L Fish(Danio rerio)

- Animal oils mixed with animal oil Me esters, sulfurized : No data

- Azelaic acid : LC50 2671.028 mg/L Fish

- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : IUCLID LC50 5 ㎎/ℓ ~ 1 ㎎/ℓ 96 hr Pimephales promelas

- Animal oils mixed with vegetable oils, sulfurized : No data

- Business Secret1 : NOEC >= 100 mg/L Fish(Pimephales promelas)

- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : LC50 > 100 mg/L 96h (Danio rerio; OECD TG 203)

○ Crustacean

- Distillates (petroleum), hydrotreated heavy paraffinic : LC50 > 10000 mg/L Aquatic invertebrates(Gammarus pulex)

- Distillates, petroleum, solvent-refined heavy naphthenic : EC50 >1000 ㎎/ℓ 48 hr Daphnia magna

- 12-Hydroxystearic acid : EC50 > 100 mg/L Aquatic invertebrates(Daphnia magna)

- Animal oils mixed with animal oil Me esters, sulfurized : No data

- Azelaic acid : EC50 > 20 mg/L Aquatic invertebrates(Daphina magna)

- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : IUCLID EC50 5 ㎎/ℓ ~ 1 ㎎/ℓ 48 hr Daphnia pulex

- Animal oils mixed with vegetable oils, sulfurized : No data

- Business Secret1 : EC50 > 10000 mg/L Aquatic invertebrates(Daphnia magna)

- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : EC50=51 ㎎/ℓ 48 hr Daphnia magna(OECD 202)

○ Acuatic algae

- Distillates (petroleum), hydrotreated heavy paraffinic : NOEC >= 100 mg/L Aquatic algae(Pseudokirchnerella subcapitata)

- Distillates, petroleum, solvent-refined heavy naphthenic : No data

- 12-Hydroxystearic acid : EC50 > 100 mg/L Aquatic algae (Pseudokirchnerella subcapitata)

- Animal oils mixed with animal oil Me esters, sulfurized : No data

- Azelaic acid : EC50 > 100 mg/L Aquatic algae(Pseudokirchnerella subcapitata)

- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : No data

- Animal oils mixed with vegetable oils, sulfurized : No data

- Business Secret1 : NOEC >= 100 mg/L Aquatic algae(Pseudokirchnerella subcapitata)

- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : ErC50 > 100 ㎎/ℓ 72 hr Desmodesmus subspicatus (OECD TG 201)

2) Persistence and degradation

○ Persistence

- Distillates (petroleum), hydrotreated heavy paraffinic : log Kow 6

- Distillates, petroleum, solvent-refined heavy naphthenic : 6 log Kow ~ 3.9 log Kow (estimated)

- 12-Hydroxystearic acid : log Pow 5.7

- Animal oils mixed with animal oil Me esters, sulfurized : No data

- Azelaic acid : log Kow 1.33

- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : No data

- Animal oils mixed with vegetable oils, sulfurized : No data

- Business Secret1 : log Kow 3.9

- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : 7.05 log Kow (>6 (HPVIS))

○ Degradation

- Distillates (petroleum), hydrotreated heavy paraffinic : No data

- Distillates, petroleum, solvent-refined heavy naphthenic : No data
- 12-Hydroxystearic acid : BOD 83 %
- Animal oils mixed with animal oil Me esters, sulfurized : No data
- Azelaic acid : No data
- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : No data
- Animal oils mixed with vegetable oils, sulfurized : No data
- Business Secret1 : No data
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : No data

○ biodegradation

- Distillates (petroleum), hydrotreated heavy paraffinic : BOD 77 %
- Distillates, petroleum, solvent-refined heavy naphthenic : 6% degradation after 28 day (aerobic, not readily biodegradable)
- 12-Hydroxystearic acid : No data
- Animal oils mixed with animal oil Me esters, sulfurized : No data
- Azelaic acid : No data
- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : No data
- Animal oils mixed with vegetable oils, sulfurized : No data
- Business Secret1 : 6 (%) 28 day (aerobic, not readily biodegradable)
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : 9 (%) 28 day (read across 68442-68-2)

3) Bioaccumulative potential

- Distillates (petroleum), hydrotreated heavy paraffinic : No data
- Distillates, petroleum, solvent-refined heavy naphthenic : BCF=5147
- 12-Hydroxystearic acid : No data
- Animal oils mixed with animal oil Me esters, sulfurized : No data
- Azelaic acid : No data
- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : No data
- Animal oils mixed with vegetable oils, sulfurized : No data
- Business Secret1 : No data
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : 12520 (estimated)

4) Mobility in soil

- Distillates (petroleum), hydrotreated heavy paraffinic : No data
- Distillates, petroleum, solvent-refined heavy naphthenic : Koc=208800
- 12-Hydroxystearic acid : Koc 902.5 L/kg
- Animal oils mixed with animal oil Me esters, sulfurized : No data
- Azelaic acid : No data
- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : No data
- Animal oils mixed with vegetable oils, sulfurized : No data
- Business Secret1 : No data
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : 60460 (estimated)

5) Hazard to the ozone laye

- Distillates (petroleum), hydrotreated heavy paraffinic : Not applicable
- Distillates, petroleum, solvent-refined heavy naphthenic : Not applicable
- 12-Hydroxystearic acid : Not applicable
- Animal oils mixed with animal oil Me esters, sulfurized : Not applicable
- Azelaic acid : Not applicable
- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : Not applicable
- Animal oils mixed with vegetable oils, sulfurized : Not applicable
- Business Secret1 : Not applicable
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Not applicable

6) Other adverse effects

- Distillates (petroleum), hydrotreated heavy paraffinic : Fish: NOEC(Pimephales promelas) >5000 mg/L/7d
- Distillates, petroleum, solvent-refined heavy naphthenic : Fish: NOEC(Pimephales promelas) >5000 mg/L/7d
- 12-Hydroxystearic acid : No data
- Animal oils mixed with animal oil Me esters, sulfurized : No data
- Azelaic acid : No data
- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : No data
- Animal oils mixed with vegetable oils, sulfurized : No data
- Business Secret1 : Fish: NOEC(Pimephales promelas) >5000 mg/L/7d
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : No data

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)

- Wear an appropriate Personal protection. (See Exposure Controls/Personal Protection section.)
- Do not allow spill material to enter sewers, storn water drains, soil, etc.
- Empty containers recycled under environmental laws.
- Empty containers may rupture when pressured.
- Empty containers may explode and residues can be ignited when pressured, cut, weld, heated.

14. TRANSPORT INFORMATION

1) UN No.

- Not applicable

2) Proper shipping name

- Not applicable

3) Class or division

- Not applicable

4) Packing group

- Not applicable

5) Marine pollutant

- Not applicable

6) Special safety response for transportation or transportation measure

- Types of Emergency Measures in Case of Fire : Not applicable
- Types of Emergency Measures in Leakage : Not applicable
- This product is not regulated for carriage according to ADR/RID, ADN, IMDG, ICAO/IATA.

15. REGULATORY INFORMATION

1) Occupational Safety and Health Act in Korea - PRODUCT :

- Animal oils mixed with vegetable oils, sulfurized : Not applicable
- Animal oils mixed with animal oil Me esters, sulfurized : Not applicable
- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : Hazardous SubstancesRequiring Management
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Not applicable
- Distillates (petroleum), hydrotreated heavy paraffinic : Not applicable
- Business Secret : Not applicable
- Distillates, petroleum, solvent-refined heavy naphthenic : Not applicable
- Azelaic acid : Not applicable
- 12-Hydroxystearic acid : Not applicable

2) Toxic Chemical Control Act in Korea - PRODUCT :

- Animal oils mixed with vegetable oils, sulfurized : Existing Commercial Chemical Substances
- Animal oils mixed with animal oil Me esters, sulfurized : Existing Commercial Chemical Substances
- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : Pollutant release and transfer register substances,Existing Commercial Chemical Substances
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Existing Commercial Chemical Substances
- Distillates (petroleum), hydrotreated heavy paraffinic : Existing Commercial Chemical Substances
- Business Secret : Existing Commercial Chemical Substances
- Distillates, petroleum, solvent-refined heavy naphthenic : Existing Commercial Chemical Substances
- Azelaic acid : Existing Commercial Chemical Substances
- 12-Hydroxystearic acid : Existing Commercial Chemical Substances

3) Safety Control of Dangerous Substances Act in Korea - PRODUCT :

- Animal oils mixed with vegetable oils, sulfurized : Not applicable
- Animal oils mixed with animal oil Me esters, sulfurized : Not applicable
- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : Not applicable
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Not applicable
- Distillates (petroleum), hydrotreated heavy paraffinic : Not applicable
- Business Secret : Not applicable
- Distillates, petroleum, solvent-refined heavy naphthenic : Not applicable
- Azelaic acid : Not applicable
- 12-Hydroxystearic acid : Not applicable

4) Wastes Control Act in Korea - PRODUCT : 지정 폐기물

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5) Other regulations in KOREA and Abroad regulations

○ U.S.A. management information(OSHA regulation)

- Animal oils mixed with vegetable oils, sulfurized : Not applicable
- Animal oils mixed with animal oil Me esters, sulfurized : Not applicable
- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : Not applicable
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Not applicable
- Distillates (petroleum), hydrotreated heavy paraffinic : Not applicable
- Business Secret : Not applicable
- Distillates, petroleum, solvent-refined heavy naphthenic : Not applicable
- Azelaic acid : Not applicable
- 12-Hydroxystearic acid : Not applicable

○ U.S.A. management information(CERCLA regulation)

- Animal oils mixed with vegetable oils, sulfurized : Not applicable
- Animal oils mixed with animal oil Me esters, sulfurized : Not applicable
- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : Not applicable
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Not applicable
- Distillates (petroleum), hydrotreated heavy paraffinic : Not applicable
- Business Secret : Not applicable
- Distillates, petroleum, solvent-refined heavy naphthenic : Not applicable
- Azelaic acid : Not applicable
- 12-Hydroxystearic acid : Not applicable

○ EU Classification (CLASSIFICATION)

- Animal oils mixed with vegetable oils, sulfurized : Not applicable
- Animal oils mixed with animal oil Me esters, sulfurized : Not applicable
- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : Not applicable
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Not applicable
- Distillates (petroleum), hydrotreated heavy paraffinic : Carc. 1B
- Business Secret : Carc. 1B
- Distillates, petroleum, solvent-refined heavy naphthenic : Carc. 1B
- Azelaic acid : Not applicable
- 12-Hydroxystearic acid : Not applicable

○ EU Classification (Risk Phrases)

- Animal oils mixed with vegetable oils, sulfurized : Not applicable
- Animal oils mixed with animal oil Me esters, sulfurized : Not applicable
- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : Not applicable
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Not applicable
- Distillates (petroleum), hydrotreated heavy paraffinic : H350
- Business Secret : H350
- Distillates, petroleum, solvent-refined heavy naphthenic : H350

- Azelaic acid : Not applicable

- 12-Hydroxystearic acid : Not applicable

○ EU Classification (Safety Phrases)

- Animal oils mixed with vegetable oils, sulfurized : Not applicable

- Animal oils mixed with animal oil Me esters, sulfurized : Not applicable

- Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts : Not applicable

- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Not applicable

- Distillates (petroleum), hydrotreated heavy paraffinic : S:53-45

- Business Secret : S:53-45

- Distillates, petroleum, solvent-refined heavy naphthenic : S:53-45

- Azelaic acid : Not applicable

- 12-Hydroxystearic acid : Not applicable

16. OTHER INFORMATION

1) Reference

- The information contained herein is believed to be accurate. It is provided independently of any sale of the product for purpose of hazard communication. It is not intended to constitute performance information concerning the product. No express warranty, or implied warranty of merchantability or fitness for a particular purpose is made with respect to the product or the information contained herein.

- This Safety Data Sheet was compiled with data and information from the following sources: KOSHA, NITE, ESIS, NLM, SIDS, IPCS

2) Print date

- 2012-11-30

3) Revision date

○ Number of revised

- 4

○ Date of last revision

- 2018-01-01

○ Last Revision History

- No revision information

4) Other

- 이 정보는 근로자 건강, 환경, 안전을 보호하고자, 현재 가용할 수 있는 DB를 근거로 하여 작성하였음.