SDS(Safety Data Sheet)

Product	Kixx Grease 2	
List No.	Issuing date	Last revised date
LB3001	2012-11-30	2020-07-10

1. IDENTIFICATION

1) Product name

Kixx Grease 2

2) Recommended use of the chemical and restriction on use

- Recommended use (Lubricants and additives)
- Restrictions on use Do not use for any other purpose.

3) Details of the supplier of the safety data sheet

○ **Manufacturer**

- Company name GS Caltex Corporation
- Address GS Tower, 508, Nonhyeon-ro, Gangnam-gu, Seoul, Korea
- Emergency telephone number 1544-5151

2. HAZARDS IDENTIFICATION

1) Classification of the product

- Not applicable

2) 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**

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

Product name	Health	Flammable	Reaction
Kixx Grease 2	0	0	0

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical name	Trade names and Synonyms	CAS No.	EC No.	Contain Ratio(%)
Distillates (petroleum), hydrotreated heavy paraffinic	Emulsifiable oil	64742-54-7	265-157-1	75 ~ 85
Distillates, petroleum, solvent-refined heavy naphthenic		64741-96-4	265-097-6	10 ~ 15
12-Hydroxy octadecanoic acid		106-14-9	203-366-1	1 ~ 6
N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene	Vanlube 81	68411-46-1	270-128-1	0 ~ 1
Boric acid, crude natural	Hydrogen orthoborate ; Orthoboric acid ; Boron trihydroxide ; Trihydroxyborane ; Boric acid ; Boracic acid	10043-35-3	233-139-2	0 ~ 0.29
Business Secret1				3 ~ 7

4. FIRST AID MEASURES

1) Eye contact

- In case of contact with material, immediately flush eyes with running water for at least 15 minutes.
- If eye irritation persists: Get medical advice/attention.

2) 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.
- If skin irritation occurs: Get medical advice/attention.

3) Inhalation

- Move victim to fresh air.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.

4) Ingestion

- If unconscious but breathing, never give anything by mouth
- If swallowed do not induce vomiting, seek medical advice immediat.
- Get immediate medical advice/attention.
- Rinse mouth.

5) Indication of any immediate medical attention and special treatment needed	- 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	- 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) - High-pressure water (Unsuitable extinguishing media)
2) Special hazards arising from the substance or mixture	- May be ignited by heat, sparks or flames. - Fire may produce irritating and/or toxic gases. - May cause toxic effects if inhaled.
3) Special protective equipment and precautions 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	- Do not touch or walk through spilled material. - ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). - Ventilate the contaminated area. - Stop leak if you can do it without risk. - Prevent dust cloud. - Please note that materials and conditions to be avoided.
2) Environmental precautions	- Prevent entry into waterways, sewers, basements or confined areas.
3) Methods and material for containment and cleaning up	- Small Spill: Flush area with flooding quantities of water. - 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. - Small Spill: Absorb with earth, sand or other non-combustible material and transfer

to containers for later disposal.

7. HANDLING AND STORAGE

1) Precautions for safe handling

- Wash ... thoroughly after handling.
- Please note that materials and conditions to be avoided.
- Handling refer to engineering control/personal protection section.
- Cuation: High temperature

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 in a closed container.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

1) Control parameters

Chemical name	Exposure limits	ACGIH TLV	OSHA PEL	Biological limit values(BLV)
Distillates (petroleum), hydrotreated heavy paraffinic	Not available	TWA 5 mg/m3, Inhalable particulate matter(Mineral oil, Pure, highly and severely refined)	Not available	Not available
Distillates, petroleum, solvent-refined heavy naphthenic	Not available	TWA 5 mg/m3, Inhalable particulate matter(Mineral oil, Pure, highly and severely refined)	Not available	Not available
12-Hydroxy octadecanoic acid	Not available	Not available	Not available	Not available
N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene	Not available	Not available	Not available	Not available
Boric acid, crude natural	Not available	TWA, 2 mg/m3, Inhalable Particulate mass	Not available	Not available
BUSINESS SECRET1	Not available	Not available	Not available	Not available

2) Appropriate engineering controls

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

3) Personal protection equipment

○ **Respiratory protection**
- Wear a adequate respiratory protection equipment with certificate by considering physicochemical properties of exposured particulate material.
- In case exposured to particulate material, the respiratory protective equipments as follow are recommended. - facepiece filtering respirator or air-putifying respirator, high-efficiency particulate air(HEPA) filter media or resporator equipped with power
- In lack of oxigan(<19.6%), wear the supplied-air respiratior or self-contained breathing apparatus.
- Consider the warning characteristics beforehand.

○ **Eye protection**
- Wear breathable safety goggles to protect from material causing eye irritation or other disorder.
- An eye wash unit and safety shower station should be available nearby work place.
- In case of direct exposure or potential exposure to the substance, wear safety glasses for chemicals approved in the country.

○ **Hand protection**
- Wear appropriate protective gloves by considering physical and chemical properties of chemicals.
- In case of direct exposure or potential exposure to the substance, wear safety gloves for chemicals approved in the country.

○ **Body protection**
- Wear appropriate protective clothing by considering physical and chemical properties of chemicals.
- In case of direct exposure or potential exposure to the substance, wear protective clothing for chemicals approved in the country.

9. PHYSICAL AND CHEMICAL PROPERTIES

Item	Input Value
Apperance	Solid
Color	No Data
Smell	a specific smell of hydrocarbon
Smell Threshold	No Data
pH (Numerical value)	No Data
Melting/Freezing Point	No Data
Boilling Point (Numerical value)	No Data
Flash Point (Numerical value)	No Data
Evaporating Rate	No Data
Flammability(Solid, Gas)	No Data
Explosibility Range	No Data
Steam Pressure	<0.1
Solubility (Numerical value)	No Data
Vapor Density	No Data

Specific Gravity	0.898
Distribution Coefficient	No Data
SelfIgnition Temperature	No Data
Pyrolysis Temperature	No Data
Viscosity (Numerical value)	No Data
Molecular Weight	No Data

10. STABILITY AND REACTIVITY

1) Chemical Stability and hazardous reactivity
- Stable under normal temperatures and pressures.
- Containers may explode when heated.
- Some may burn but none ignite readily.

2) Conditions to avoid
- Ignition source(heat, spark, flame)

3) Incompatible materials
- Combustibles
- Irritating and/or toxic gas

4) Hazardous decomposition products
- Not available

11. TOXICOLOGICAL INFORMATION

1) Information on the likely routes of exposures

○ **Inhalation**

- No inhalation effects through respiratory system.

○ **Skin contact**

- No effect on skin contact.

○ **Eye contact**

- No effect on eye contact.

○ **Ingestion**

- No ingestion effect through mouth.

2) Health hazard information

○ **Acute toxicity**

*** Oral - Not classified (ATEmix > 2000 mg/kg)**

- Distillates (petroleum), hydrotreated heavy paraffinic : rat(male/female), LD50 > 5,000 mg/kg bw, no deaths (read-across: 64742-56-9) (OECD TG 401, GLP)(ECHA)
- Distillates, petroleum, solvent-refined heavy naphthenic : rat(male/female); LD50 > 5000 mg/kg bw, no deaths (OECD TG 401, GLP) (read across: 64742-56-9) (ECHA)
- 12-Hydroxy octadecanoic acid : rat(male); LD50 > 10000 mg/kg (OECD TG 401) (read across: castor oil, hydrogenated) (ECHA)
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : rat(male/female); LD50 > 5000 mg/kg bw, no deaths (OECD TG 401) (ECHA)
- Boric acid, crude natural : rat(male); LD50 > 2600mg/kg bw, no deaths (OECD TG 401, GLP) (ECHA)

*** Dermal - Not classified (ATEmix > 2000 mg/kg)**

- Distillates (petroleum), hydrotreated heavy paraffinic : rabbit(male/female), LD50 > 5,000 mg/kg bw, no deaths (read-across: 64742-56-9) (OECD TG 402, GLP)(ECHA)
- Distillates, petroleum, solvent-refined heavy naphthenic : rabbit(male/female); LD50 > 5000 ㎎/㎏ bw, no deaths (OECD TG 402, GLP) (read across: 64742-56-9) (ECHA)
- 12-Hydroxy octadecanoic acid : Not available
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : rat(male/female); LD50 > 2000 ㎎/㎏ bw, no deaths (OECD TG 402) (ECHA)
- Boric acid, crude natural : rabbit(male/female); LD50 > 2000 ㎎/㎏ bw, no deaths (FIFRA (40 CFR 163)) (ECHA)

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

- Distillates (petroleum), hydrotreated heavy paraffinic : Not applicable
- Distillates, petroleum, solvent-refined heavy naphthenic : Not applicable
- 12-Hydroxy octadecanoic acid : Not applicable
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Not applicable
- Boric acid, crude natural : Not applicable

*** Inhalation(Vapour) - Not applicable**

- Distillates (petroleum), hydrotreated heavy paraffinic : rat(male/female), LC50 > 5.53 mg/L air /4h No deaths (read-across: MRD-87-102) (OECD TG 403)(ECHA)
- Distillates, petroleum, solvent-refined heavy naphthenic : Not available
- 12-Hydroxy octadecanoic acid : Not available
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Not available
- Boric acid, crude natural : Not available

*** Inhalation(Dust, mist) - Not classified (ATEmix > 5 mg/L)**

- Distillates (petroleum), hydrotreated heavy paraffinic : Not available
- Distillates, petroleum, solvent-refined heavy naphthenic : rat(male/female); inhalation: aerosol; LC50 > 5.53 mg/L air /4h, no deaths (OECD TG 403) (read across: MRD-87-102) (ECHA)
- 12-Hydroxy octadecanoic acid : Not available
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Not available
- Boric acid, crude natural : rat(male/female); inhalation: dust; LC50 > 2.12 mg/L air 4h, no deaths (OECD TG 403, GLP) (ECHA)

○ Skin corrosion/Irritation : Not classified

- Distillates (petroleum), hydrotreated heavy paraffinic	:	Solvent dewaxed light paraffinic oil is not considered to be irritating to the skin of rabbits. (read across : 64742-56-9) (GLP)(ECHA)
- Distillates, petroleum, solvent-refined heavy naphthenic	:	rabbit; not irritating (GLP) (read across: 64742-56-9) (ECHA)
- 12-Hydroxy octadecanoic acid	:	rabbit; not irritating (OECD TG 404, GLP) (read across: castor oil, hydrogenated) (ECHA)
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene	:	rabbit; not irritating (OECD TG 404) (ECHA)
- Boric acid, crude natural	:	rabbit; not irritating (FIFRA (40 CFR 163)) (ECHA)

○ **Serious eye damage/irritation : Not classified**

- Distillates (petroleum), hydrotreated heavy paraffinic : Solvent dewaxed light paraffinic oil is not considered to be an ocular irritant. (read-aross: 64742-56-9) (OECD TG 405, GLP)(ECHA)
- Distillates, petroleum, solvent-refined heavy naphthenic : rabbit; not irritating (OECD TG 405, GLP) (read across: 64742-56-9) (ECHA)
- 12-Hydroxy octadecanoic acid : rabbit; not irritating (OECD TG 405, GLP) (read across: 'Fatty acids, castor-oil, hydrogenated') (ECHA)
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : rabbit; not irritating (OECD TG 405) (ECHA)
- Boric acid, crude natural : rabbit; not irritating (OECD TG 405, GLP) (ECHA)

○ **Respiratory sensitization : Not classified**

- Distillates (petroleum), hydrotreated heavy paraffinic : Not available
- Distillates, petroleum, solvent-refined heavy naphthenic : Not available
- 12-Hydroxy octadecanoic acid : Not available
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Not available
- Boric acid, crude natural : Not available

○ **Skin sensitization : Not classified**

- Distillates (petroleum), hydrotreated heavy paraffinic : Under the conditions of the test, Solvent dewaxed light paraffinic oil is considered non-sensitizing. (read-aross: 64742-56-9) (OECD TG 406, GLP)(ECHA)
- Distillates, petroleum, solvent-refined heavy naphthenic : guinea pig; not sensitising (OECD TG 406, GLP) (read across: 64742-53-6) (ECHA)
- 12-Hydroxy octadecanoic acid : guinea pig; not sensitising (OECD TG 406, GLP) (ECHA)
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : guinea pig; not sensitising (OECD TG 406, GLP) (ECHA)
- Boric acid, crude natural : guinea pig; not sensitising (OECD TG 406, GLP) (ECHA)

○ **Carcinogenicity : Not classified**

- Distillates (petroleum), hydrotreated heavy paraffinic : EU CLP 1272/2008 : Carc. 1B (Note L : The classification as a carcinogen need not apply if it can be shown that the substance contains less than 3% DMSO extract as measured by IP 346)
- Distillates, petroleum, solvent-refined heavy : EU CLP 1272/2008 : Carc. 1B (Note L : The classification as a carcinogen need not apply if it can be shown that the substance contains less than 3% DMSO

naphthenic | extract as measured by IP 346)

- 12-Hydroxy octadecanoic acid : IARC, OSHA, NTP, IRIS, ACGIH, EU CLP 1272/2008 : not listed
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : IARC, OSHA, NTP, IRIS, ACGIH, EU CLP 1272/2008 : not listed
- Boric acid, crude natural : ACGIH : A4 - Not Classifiable as a Human Carcinogen (listed under Borate compounds, inorganic)

○ **Germ cell mutagenicity : Not classified**

- Distillates (petroleum), hydrotreated heavy paraffinic : In vitro(CHO cell) Chromosome Aberration Test: negative (read-aross : 64742-53-6) (OECD TG 473, GLP)
  In vivo (mouse micronucleus assay) : negative (read-across : SDPO = solvent-extracted, dewaxed paraffin oil) (OECD TG 474)(ECHA)
- Distillates, petroleum, solvent-refined heavy naphthenic : In vitro Bacterial Reverse Mutation Assay : positive (OECD TG 471) (read across: 64741-50-0) (ECHA), In Vitro Mammalian Chromosome Aberration Test : negative (OECD TG 473) (read across: L-06 Light Hydrotreated Feedstock) (ECHA)
  In vivo Mammalian Erythrocyte Micronucleus Test : negative (OECD TG 474) (read across: solvent-extracted, dewaxed paraffin oil) (ECHA)
- 12-Hydroxy octadecanoic acid : In vitro Bacterial Reverse Mutation Assay : negative (OECD TG 471) (ECHA), In Vitro Mammalian Chromosome Aberration Test : negative (OECD TG 473) (ECHA), In Vitro Mammalian Cell Gene Mutation Test : negative (OECD TG 476) (ECHA)
  In vivo : Not available
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : In vitro Bacterial Reverse Mutation Assay : negative (OECD TG 471) (ECHA)
  In vivo rodent dominant lethal assay : negative (OECD TG 478) (ECHA)
- Boric acid, crude natural : In vitro bacterial reverse mutation assay; negative (OECD TG 471, GLP) (ECHA), In Vitro Mammalian Cell Gene Mutation Test : negative (OECD TG 476, GLP) (ECHA)
  In vivo Mammalian Erythrocyte Micronucleus Test: negative (OECD TG 474, GLP) (ECHA)

○ **Reproductive toxicity : Not classified**

- Distillates (petroleum), hydrotreated heavy paraffinic : Reproductive performance was not adversely affected at any dose level evaluated. There were no neonatal toxicity observed at any dose level. There were no differences in terms of systemic toxicity between either of the dose formulations. (read-aross : Chevron 100 Neutral) (OECD TG 421, GLP)(ECHA)
- Distillates, petroleum, solvent-refined heavy naphthenic : rat(male/female); 1000 mg/kg/day; Reproduction / Developmental Toxicity Screening Test; Reproductive performance was not adversely affected at any dose level evaluated. There were no neonatal toxicity observed at any dose level. There were no differences in terms of systemic toxicity between either of the dose formulations. (OECD TG 421, GLP) (read across: Chevron 100 Neutral) (ECHA)
- 12-Hydroxy octadecanoic acid : rat and mouse(male/female); 0, 0.62, 1.25, 2.5, 5.0 or 10% in diet; Under the test conditions, a reproductive NOAEC value for male/female rats and mice was determined to be 10% (i.e., ca. 5,000 mg/kg bw/day in rats and 13,000 mg/kg

bw/day in mice), after 13 weeks of exposure to castor oil. (OECD TG 422) (read across: Castor oil) (ECHA)

- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : rat(male/female); 25, 75 and 225 mg/kg bw; No toxicologically relevant effects on reproductive parameters were noted with treatment up to 225 mg/kg bw/day. The mating, fertility and conception indices, precoital time, and number of corpora lutea and implantation sites were unaffected by treatment. No toxicologically relevant effects on the gestation index and duration, parturition, maternal care or on most aspects of early postnatal pup development (clinical signs, body weight and macroscopy) were observed up to 225 mg/kg bw/day. (OECD TG 422, GLP) (ECHA)
- Boric acid, crude natural : Adverse effects on reproduction of parental animals and development of pups at doses producing no parental toxicity (J-GHS)

○ Specific target organ toxicity (single exposure) : Not classified

- Distillates (petroleum), hydrotreated heavy paraffinic : Hydronephrosis of the right kidney was observed in one rat but was not considered treatment-related by the study authors. No other abnormalities were observed in any male or female rats. (read-across: 64742-56-9) (OECD TG 401, GLP)(ECHA)

  Dermal administration of API 78-9 at 5000 mg/kg did not result in any dermal irritation or signs of clinical toxicity. Gross necroscopy did not reveal any signs of systemic toxicity at the 5000 mg/kg dose level. (read-across: 64742-56-9) (OECD TG 402, GLP)(ECHA)
- Distillates, petroleum, solvent-refined heavy naphthenic : oral; rat(male/female); No clinical signs of toxicity observed in either male or female rats. LD50 > 5000 ㎎/kg bw, no deaths (OECD TG 401, GLP) (read across: 64742-56-9) (ECHA)

  dermal; rabbit(male/female); No visible signs of clinical toxicity were observed in male and female rabbits dosed with API 78-9 at 5000 mg/kg. LD50 > 5000 ㎎/kg bw, no deaths (OECD TG 402, GLP) (read across: 64742-56-9) (ECHA)

  inhalation: aerosol; rat(male/female); The test material which was deposited on the animal fur during exposure diminished by observation Day 10. No mortality in either the control or exposed group was reported. There were no statistically significant differences in mean body weight between groups. LC50 > 5.53 mg/L air /4h, no deaths (OECD TG 403) (read across: MRD-87-102) (ECHA)
- 12-Hydroxy octadecanoic acid : oral; rat(male); No signs of toxicity observed. LD50 > 10000 mg/kg (OECD TG 401) (read across: castor oil, hydrogenated) (ECHA)
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : oral; rat(male/female); No compound related gross organ changes were observed. LD50 > 5000 ㎎/kg bw, no deaths (OECD TG 401) (ECHA)

  dermal; rat(male/female); No adverse findings noted. LD50 > 2000 ㎎/kg bw, no deaths (OECD TG 402) (ECHA)
- Boric acid, crude natural : dermal; rabbit(male/female); No gross necrospy findings were observed. LD50 > 2000 ㎎/kg bw, no deaths (FIFRA (40 CFR 163)) (ECHA)

  inhalation: dust; rat(male/female); No specific findings observed, except red lung discolouration consistent with carbon dioxide inhalation caused by the euthanisation technique. All tissues and organs were normal. LC50 > 2.12 mg/L air 4h, no deaths (OECD TG 403, GLP) (ECHA)

○ Specific target organ toxicity (repeated exposure) : Not classified

- Distillates (petroleum), : The systemic toxicity NOAEL for this 28-day dermal toxicity study in the rabbit

hydrotreated heavy paraffinic		is 1,000 mg/kg, based on the lack of adverse systemic effects observed at this dose level. (read-aross : 64742-53-6) (OECD TG 410, GLP)(ECHA) No systemic effects were observed. The NOAEL for lung changes associated with oil deposition in the lungs was 220 mg/m3. As no systemic toxicity was observed, the overall NOAEL for systemic effects was > 980 mg/m3. (read-aross : 64742-70-7) (OECD TG 412)(ECHA)
- Distillates, petroleum, solvent-refined heavy naphthenic	:	rabbit(male/female); dermal; The systemic toxicity NOAEL for this 28-day dermal toxicity study in the rabbit is 1,000 mg/kg, based on the lack of adverse systemic effects observed at this dose level. (OECD TG 410, GLP) (read across: 64742-53-6) (ECHA)
- 12-Hydroxy octadecanoic acid	:	rat and mouse(male/female); 0, 0.62, 1.25, 2.5, 5.0 or 10% in diet; Under the test conditions, the NOAEC value for male/female rats and mice were determined to be 10% (i.e., ca. 5,000 mg/kg bw/day in rats and 13,000 mg/kg bw/day in mice), after 13 wk exposure of castor oil. (OECD TG 422) (read across: Castor oil) (ECHA)
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene	:	rat(male); oral; 28 days; Based on the absence of clinical findings and effects on body weight, dose levels of 100, 300 and 1000 mg/kg bw were chosen for subchronic dosing. (ECHA)
- Boric acid, crude natural	:	oral; rat(male/female); 2 years; Testicular atrophy and seminiferous tubule degeneration was observed at 6, 12 and 24 months at the highest dose level only. No treatment related effects were observed in the mid and low dose groups. (ECHA)

○ **Aspiration hazard : Not classified**

- Distillates (petroleum), hydrotreated heavy paraffinic	:	Viscosity: 73.9 mm2/s (40°C)(ECHA) & hydrocarbons
- Distillates, petroleum, solvent-refined heavy naphthenic	:	> 2 mm2/s (40°C) (ECHA) & hydrocarbons
- 12-Hydroxy octadecanoic acid	:	Not available
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene	:	352.7 mm²/s (40°C) (ECHA) & not hydrocarbons
- Boric acid, crude natural	:	Not available

12. ECOLOGICAL INFORMATION

1) Ecotoxicity

- Acute toxicity : Not classfied (ATEmix>1mg/L)
- Chronic toxicity : Not classfied

○ **Acute (short-term) aquatic hazard:**

Fish

- 12-Hydroxy octadecanoic acid : 96h-LC50(Danio rerio) > 1000 mg/L (OECD TG 203, GLP) (read across: Castor oil, hydrogenated) (ECHA); No toxic effects up to the limit of water solubility (0.976 mg/L)

- Boric acid, crude natural : 96h-LC50(Pimephales promelas) = 79.7 mg/L (EPA OPPTS 850.1075) (read across: Mixture of 82% (weight) boric acid and 18% borax) (ECHA)
- Distillates, petroleum, solvent-refined heavy naphthenic : 96h-LL50(Pimephales promelas) > 100 mg/L (OECD TG 203, GLP) (ECHA)
- Distillates (petroleum), hydrotreated heavy paraffinic : 96h-LL50(Pimephales promelas) > 100 mg/L (OECD TG 203, GLP)(ECHA)
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : 96h-LC50(Danio rerio) > 100 mg/L (OECD TG 203) (ECHA); No toxic effects occur within the range of water solubility.

Invertebrates

- 12-Hydroxy octadecanoic acid : 48h-EC50(Daphnia magna) > 100 mg/L (OECD TG 202, GLP) (ECHA); No toxic effects up to the limit of water solubility (0.976 mg/L)
- Boric acid, crude natural : 48h-LC50(Ceriodaphnia dubia) = 102 mg/L (OECD TG 202) (ECHA)
- Distillates, petroleum, solvent-refined heavy naphthenic : 48h-EL50(Daphnia magna) > 10000 mg/L (OECD TG 202) (ECHA)
- Distillates (petroleum), hydrotreated heavy paraffinic : 48h-EL50(Daphnia magna) > 10,000 mg/L(read across : 64742-53-6 or 64741-97-5) (OECD TG 202)(ECHA)
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : 48h-EC50(Daphnia magna) = 51 mg/L (OECD TG 202, GLP) (ECHA); No toxic effects occur within the range of water solubility.

Aquatic algae

- 12-Hydroxy octadecanoic acid : 72h-ErC50(Pseudokirchneriella subcapitata) > 100 mg/L (OECD TG 201, GLP) (ECHA); No toxic effects up to the limit of water solubility (0.976 mg/L)
- Boric acid, crude natural : 72h-ErC50(Pseudokirchneriella subcapitata) = 52.4 mg/L (OECD TG 201, GLP) (ECHA)
- Distillates, petroleum, solvent-refined heavy naphthenic : Not available
- Distillates (petroleum), hydrotreated heavy paraffinic : Not available
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : 72h-ErC50(Desmodesmus subspicatus) > 100 mg/L (OECD TG 201) (ECHA); No toxic effects occur within the range of water solubility.

○ **Chronic (Long-term) aquatic hazard:**

Fish

- 12-Hydroxy octadecanoic acid : Not available
- Boric acid, crude natural : 34d-NOEC(Danio rerio) = 6.4 mg/L (OECD TG 210, GLP) (ECHA)
- Distillates, petroleum, solvent-refined heavy naphthenic : Not available
- Distillates (petroleum), hydrotreated heavy paraffinic : Not available
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Not available

Invertebrates

- 12-Hydroxy octadecanoic acid : Not available
- Boric acid, crude natural : 28d-NOEL(Americamysis bahia) = 18.6 mg/L (EPA OPPTS 850.1350, GLP) (ECHA)
- Distillates, petroleum, solvent-refined heavy naphthenic : 21d-NOEL(Daphnia magna) = 10 mg/L (OECD TG 211, GLP) (ECHA)
- Distillates (petroleum), hydrotreated heavy paraffinic : 21d-NOEL(Daphnia magna)=10 mg/L(OECD TG 211, GLP)(ECHA)
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : 21d-EL10(Daphnia magna) = 1.69 mg/L (OECD TG 211, GLP) (ECHA)

Aquatic algae

- 12-Hydroxy octadecanoic acid : 72h-NOErC(Pseudokirchneriella subcapitata) >= 100 mg/L (OECD TG 201,

GLP) (ECHA); No toxic effects up to the limit of water solubility (0.976 mg/L)

- Boric acid, crude natural : 72h-NOErC(Pseudokirchneriella subcapitata) = 17.5 mg/L (OECD TG 201, GLP) (ECHA)
- Distillates, petroleum, solvent-refined heavy naphthenic : 72h-NOErL(Pseudokirchneriella subcapitata) >=100 mg/L (OECD TG 201) (ECHA)
- Distillates (petroleum), hydrotreated heavy paraffinic : 72h-NOErL(Pseudokirchnerella subcapitata) >= 100 mg/L (OECD TG 201) (ECHA)
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : 72h-NOErC(Desmodesmus subspicatus) = 10-100 mg/L (OECD TG 201) (ECHA); No toxic effects occur within the range of water solubility.

2) Persistence and degradability

○ **Persistence**

- 12-Hydroxy octadecanoic acid : log Kow=5.7 (OECD TG 117, GLP) (ECHA)
- Boric acid, crude natural : log Kow = -1.09 (22 °C; pH:7.5) (EU Method A.8, GLP) (ECHA)
- Distillates, petroleum, solvent-refined heavy naphthenic : log Kow = 6.13 (experimental) (EPISUITE)
- Distillates (petroleum), hydrotreated heavy paraffinic : This substance is UVCB, so not applicable.(ECHA)
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : log Kow=7.05 (estimated) (EPISUITE)

○ **Degradability**

- 12-Hydroxy octadecanoic acid : Not available
- Boric acid, crude natural : Not available
- Distillates, petroleum, solvent-refined heavy naphthenic : Not available
- Distillates (petroleum), hydrotreated heavy paraffinic : Not available
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : In contact with water no hydrolysis is expected. (ECHA)

3) Bioaccumulative potential

○ **Bioaccumulation**

- 12-Hydroxy octadecanoic acid : BCF=56.23 (ECHA)
- Boric acid, crude natural : BCF=3.162 (estimated) (EPISUITE)
- Distillates, petroleum, solvent-refined heavy naphthenic : BCF = 5147 (estimated) (EPISUITE)
- Distillates (petroleum), hydrotreated heavy paraffinic : This substance is UVCB, so not applicable.(ECHA)
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : BCF=1730 (ECHA)

○ **Biodegradation**

- 12-Hydroxy octadecanoic acid : 95 % degradation after 21 days; readily biodegradable (OECD TG 301B) (ECHA)
- Boric acid, crude natural : Not available
- Distillates, petroleum, solvent-refined heavy naphthenic : 31 % degradation after 28d; not readily biodegradable (OECD TG 301F, GLP) (ECHA)
- Distillates (petroleum), hydrotreated heavy paraffinic : 31% degradation after 28 days (OECD TG 301F) (read across: Solvent Neutral 600 Base Oil (MRD-94-981)) (OECD TG 301F, GLP)(ECHA)
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : 1% degradation after 28 days; under test conditions no biodegradation observed (OECD TG 301B, GLP) (ECHA)

4) Mobility in soil

- 12-Hydroxy octadecanoic acid : Koc=1949 (EPISUITE)
- Boric acid, crude natural : Koc=1.403 (EPISUITE)
- Distillates, petroleum, solvent-refined heavy naphthenic : Koc=208800 (EPISUITE)

- Distillates (petroleum), hydrotreated heavy paraffinic : Not available
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Koc=60460 (EPISUITE)

5) Hazard to the ozone layer

- 12-Hydroxy octadecanoic acid : Not applicable
- Boric acid, crude natural : Not applicable
- Distillates, petroleum, solvent-refined heavy naphthenic : Not applicable
- Distillates (petroleum), hydrotreated heavy paraffinic : Not applicable
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Not applicable

6) Other adverse effects

- 12-Hydroxy octadecanoic acid : Not available
- Boric acid, crude natural : Not available
- Distillates, petroleum, solvent-refined heavy naphthenic : Not available
- Distillates (petroleum), hydrotreated heavy paraffinic : Not available
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Not available

13. DISPOSAL CONSIDERATIONS

1) Disposal methods

- Waste must be disposed of in accordance with federal, state and local environmental control regulation.

2) Special precaution for disposal

- Consider the required attentions in accordance with waste treatment management regulation.

14. TRANSPORT INFORMATION

1) UN No.

- Not applicable

2) Proper shipping name

- Not applicable

3) Transport hazard class(es)

- 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
- Transport regulations according to ADR/RID, AND, IMDG and ICAO/IATA : Not applicable

15. REGULATORY INFORMATION

EINECS(or ELINCS)

- 12-Hydroxy octadecanoic acid : European EINECS phase-in substance
- Boric acid, crude natural : European EINECS phase-in substance

- Distillates, petroleum, solvent-refined heavy naphthenic : European EINECS phase-in substance
- Distillates (petroleum), hydrotreated heavy paraffinic : European EINECS phase-in substance
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : European EINECS phase-in substance
- Business Secret1 : Not applicable

EU CLP (CLASSIFICATION) - PRODUCT : Not applicable

- 12-Hydroxy octadecanoic acid : Not applicable
- Boric acid, crude natural : Not applicable
- Distillates, petroleum, solvent-refined heavy naphthenic : Not applicable
- Distillates (petroleum), hydrotreated heavy paraffinic : Not applicable
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Not applicable
- Business Secret1 : Not applicable

Substances restricted under REACH

- 12-Hydroxy octadecanoic acid : Not applicable
- Boric acid, crude natural : Substances restricted under REACH
- Distillates, petroleum, solvent-refined heavy naphthenic : Substances restricted under REACH
- Distillates (petroleum), hydrotreated heavy paraffinic : Substances restricted under REACH
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Not applicable
- Business Secret1 : Not applicable

Substances subject to authorization under REACH

REACH SVHC List

Korea

○ **Occupational Safety and Health Act**

- 12-Hydroxy octadecanoic acid : Not applicable
- Boric acid, crude natural : Not applicable
- Distillates, petroleum, solvent-refined heavy naphthenic : Not applicable
- Distillates (petroleum), hydrotreated heavy paraffinic : Not applicable
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Not applicable
- Business Secret1 : Not applicable

○ **K-REACH**

- 12-Hydroxy octadecanoic acid : Phase-in Substances
- Boric acid, crude natural : Phase-in Substances subject to Registration, Substance subject to intensive control (2019), Phase-in Substances
- Distillates, petroleum, solvent-refined heavy naphthenic : Phase-in Substances
- Distillates (petroleum), hydrotreated heavy paraffinic : Phase-in Substances
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Phase-in Substances
- Business Secret1 : Not applicable

○ **Chemical Control Act in Korea**

- 12-Hydroxy octadecanoic acid : Not applicable
- Boric acid, crude natural : Toxic substance, List of substance subjected to the PRTR
- Distillates, petroleum, solvent-refined heavy naphthenic : Not applicable
- Distillates (petroleum), hydrotreated heavy paraffinic : Not applicable
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Not applicable
- Business Secret1 : Not applicable

○ **Safety Control of Dangerous Substances Act**

- 12-Hydroxy octadecanoic acid : Not applicable
- Boric acid, crude natural : Not applicable
- Distillates, petroleum, solvent-refined heavy naphthenic : Not applicable
- Distillates (petroleum), hydrotreated heavy paraffinic : Dangerous substance
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Not applicable
- Business Secret1 : Not applicable

U.S.A

○ **US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)**

- 12-Hydroxy octadecanoic acid : Not applicable
- Boric acid, crude natural : Not applicable
- Distillates, petroleum, solvent-refined heavy naphthenic : Not applicable
- Distillates (petroleum), hydrotreated heavy paraffinic : Not applicable
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Not applicable
- Business Secret1 : Not applicable

○ **CERCLA Designation of hazardous substances (40 CFR 302.4)**

- 12-Hydroxy octadecanoic acid : Not applicable
- Boric acid, crude natural : Not applicable
- Distillates, petroleum, solvent-refined heavy naphthenic : Not applicable
- Distillates (petroleum), hydrotreated heavy paraffinic : Not applicable
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Not applicable
- Business Secret1 : Not applicable

○ **CERCLA Section 302 regulation**

- 12-Hydroxy octadecanoic acid : Not applicable
- Boric acid, crude natural : Not applicable
- Distillates, petroleum, solvent-refined heavy naphthenic : Not applicable
- Distillates (petroleum), hydrotreated heavy paraffinic : Not applicable
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Not applicable
- Business Secret1 : Not applicable

○ **CERCLA Section 304 regulation**

- 12-Hydroxy octadecanoic acid : Not applicable
- Boric acid, crude natural : Not applicable
- Distillates, petroleum, solvent-refined heavy naphthenic : Not applicable
- Distillates (petroleum), hydrotreated heavy paraffinic : Not applicable
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Not applicable
- Business Secret1 : Not applicable

○ **CERCLA Section 313 regulation**

- 12-Hydroxy octadecanoic acid : Not applicable
- Boric acid, crude natural : Not applicable
- Distillates, petroleum, solvent-refined heavy naphthenic : Not applicable
- Distillates (petroleum), hydrotreated heavy paraffinic : Not applicable
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Not applicable
- Business Secret1 : Not applicable

Interntional Convention on Environment

○ **Rotterdam Convention list**

- 12-Hydroxy octadecanoic acid : Not applicable

- Boric acid, crude natural : Not applicable
- Distillates, petroleum, solvent-refined heavy naphthenic : Not applicable
- Distillates (petroleum), hydrotreated heavy paraffinic : Not applicable
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Not applicable
- Business Secret1 : Not applicable

○ **Stockholm Convention list**

- 12-Hydroxy octadecanoic acid : Not applicable
- Boric acid, crude natural : Not applicable
- Distillates, petroleum, solvent-refined heavy naphthenic : Not applicable
- Distillates (petroleum), hydrotreated heavy paraffinic : Not applicable
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Not applicable
- Business Secret1 : Not applicable

○ **Montreal Protocol list**

- 12-Hydroxy octadecanoic acid : Not applicable
- Boric acid, crude natural : Not applicable
- Distillates, petroleum, solvent-refined heavy naphthenic : Not applicable
- Distillates (petroleum), hydrotreated heavy paraffinic : Not applicable
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Not applicable
- Business Secret1 : Not applicable

National Inventory

○ **Korea**

- 12-Hydroxy octadecanoic acid : Phase-in Substances
- Boric acid, crude natural : Phase-in Substances
- Distillates, petroleum, solvent-refined heavy naphthenic : Phase-in Substances
- Distillates (petroleum), hydrotreated heavy paraffinic : Phase-in Substances
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Phase-in Substances
- Business Secret1 : Not applicable

○ **U.S.A**

- 12-Hydroxy octadecanoic acid : US TSCA phase-in substance
- Boric acid, crude natural : US TSCA phase-in substance
- Distillates, petroleum, solvent-refined heavy naphthenic : US TSCA phase-in substance
- Distillates (petroleum), hydrotreated heavy paraffinic : US TSCA phase-in substance
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : US TSCA phase-in substance
- Business Secret1 : Not applicable

○ **China**

- 12-Hydroxy octadecanoic acid : China phase-in substance
- Boric acid, crude natural : China phase-in substance
- Distillates, petroleum, solvent-refined heavy naphthenic : China phase-in substance
- Distillates (petroleum), hydrotreated heavy paraffinic : China phase-in substance
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : China phase-in substance
- Business Secret1 : Not applicable

○ **Japan**

- 12-Hydroxy octadecanoic acid : Japan ENCS phase-in substance
- Boric acid, crude natural : Japan ENCS phase-in substance
- Distillates, petroleum, solvent-refined heavy naphthenic : Not applicable

- Distillates (petroleum), hydrotreated heavy paraffinic : Not applicable
- N-Phenylbenzenamine reaction products with 2,4,4-trimethylpentene : Not applicable
- Business Secret1 : Not applicable

16. OTHER INFORMATION

1) Reference

- Sources of information used in preparing this SDS included one or more of the following: Internal technical data, data from OECD eChemPortal, ECHA, NITE, TOXNET, IPCS and KOSHA search results.

2) Issue Date

- 2012-11-30

3) Revision number and Last date revised

○ **Number of revised**

- 4

○ **Date of last revision**

- 2020-07-10

○ **Last Revision History**

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4) Other

- The information contained in the Safety Data Sheet is at the date of its issuance to the best of our knowledge correct according to the data available to us. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user's end product, if applicable.