SDS(Safety Data Sheet)

Product	Kixx Turbine EP 46 (formerly, GS Turbine EP 46)		
MSDS Number	List No.	Issuing date	Last revised date
-	LB2678	2018-01-01	2026-01-28

1. IDENTIFICATION

1) Product name

Kixx Turbine EP 46 (formerly, GS Turbine EP 46)

2) Recommended use of the chemical and restriction on use

- Recommended use Lubricants
- 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 1899-5145

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 Turbine EP 46 (formerly, GS Turbine EP 46)	0	1	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	99.0 ~ 99.8
Distillates (petroleum), catalytic reformer fractionator residue, low-boiling	DISTILLATES RESIDUE, LOW-BOILING	68477-31-6	270-722-0	0.3 ~ 0.5
Trade secret				0.10 ~ 0.49
ar-Nonyl-N-(nonylphenyl)benzenamine	DINONYL DIPHENYLAMINE	36878-20-3	253-249-4	0.1 ~ 0.2
N-Phenyl-1-naphthalamine	1-(N-Phenylamino)-naphthalene ; 1-Anilinonaphthalene ; 1-Naphthylphenylamine	90-30-2	201-983-0	0.1 ~ 0.2
2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate				0.01 ~ 0.03

※ Except for the above components, all components are not listed as they do not meet the criteria for hazardous risk classification in Article 104 (Classification of Hazardous Factors) of Regulated Acts and Occupational Safety and Health Act.

※ This product has less than 3% DMSO extract as measured by the IP346 method.

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

- Small Spill: Flush area with flooding quantities of water.

containment and cleaning up

- 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	TWA : 0.8 mg/m3	TWA 5 mg/m3, Inhalable particulate matter(Mineral oil, Pure, highly and severely refined)	Not available	Not available
Distillates (petroleum), catalytic reformer fractionator residue, low-boiling	Not available	Not available	Not available	Not available
Trade secret	Not available	Not available	Not available	Not available
ar-Nonyl-N-(nonylphenyl)benzenamine	Not available	Not available	Not available	Not available
N-Phenyl-1-naphthalamine	Not available	Not available	Not available	Not available
2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate	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	Liquid
Color	No Data
Smell	No Data
Smell Threshold	No Data
pH (Numerical value)	No Data
Melting/Freezing Point	No Data
Boilling Point	No Data
Flash Point	220 ℃
Evaporating Rate	No Data
Flammability(Solid, Gas)	No Data
Explosibility Range	No Data
Steam Pressure	No Data
Solubility	No Data

Vapor Density	No Data
Specific Gravity	0.86
Distribution Coefficient	No Data
SelfIgnition Temperature	No Data
Pyrolysis Temperature	No Data
Viscosity	46 mm2/s (at 40℃)
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), catalytic reformer fractionator residue, low-boiling : Not available
- Trade secret : Not available
- ar-Nonyl-N-(nonylphenyl)benzenamine : rat(male/female); LD50 > 5000 ㎎/kg bw, no deaths (OECD TG 401) (ECHA)
- N-Phenyl-1-naphthalamine : rat(male); LD50 = 1625 mg/kg (OECD TG 401) (ECHA)

- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not available

*** 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), catalytic reformer fractionator residue, low-boiling : Not available
- Trade secret : Not available
- ar-Nonyl-N-(nonylphenyl)benzenamine : rat(male/female); LD50 > 2000 ㎎/kg bw (OECD TG 402) (ECHA)
- N-Phenyl-1-naphthalamine : rabbit(male); LD50 > 5000 mg/kg (OECD TG 402) (ECHA)
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not available

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

- Distillates (petroleum), hydrotreated heavy paraffinic : Not applicable
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Not applicable
- Trade secret : Not available
- ar-Nonyl-N-(nonylphenyl)benzenamine : Not applicable
- N-Phenyl-1-naphthalamine : Not applicable
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not available

*** Inhalation(Vapour) - Not classified (ATEmix > 20 mg/L)**

- Distillates (petroleum), hydrotreated heavy paraffinic : Not available
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Not available
- Trade secret : Not available
- ar-Nonyl-N-(nonylphenyl)benzenamine : Not available
- N-Phenyl-1-naphthalamine : Not available
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not available

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

- Distillates (petroleum), hydrotreated heavy paraffinic : inhalation: aerosol; rat(male/female); 4h-LC50 > 5.53 mg/L. No deaths (read-across: MRD-87-102) (OECD TG 403)(ECHA)
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Not available
- Trade secret : Not available
- ar-Nonyl-N-(nonylphenyl)benzenamine : Not available
- N-Phenyl-1-naphthalamine : Not available
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not available

○ 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), catalytic reformer fractionator residue, low-boiling	:	Not available
- Trade secret	:	Not available
- ar-Nonyl-N-(nonylphenyl)benzenamine	:	rabbit; slightly irritating (OECD TG 404, GLP) (read across: TK12340) (ECHA)
- N-Phenyl-1-naphthalamine	:	rabbit; not irritating (OECD TG 404) (ECHA)
- 2-Propenoic acid ethyl	:	Not available

ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate

○ **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) (equivalent or similar to guideline OECD TG 405, GLP) (ECHA)
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Not available
- Trade secret : Not available
- ar-Nonyl-N-(nonylphenyl)benzenamine : rabbit; not irritating (OECD TG 405, GLP) (read across: TK12340) (ECHA)
- N-Phenyl-1-naphthalamine : rabbit; not irritating (OECD TG 405) (ECHA)
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not available

○ **Respiratory sensitization : Not classified**

- Distillates (petroleum), hydrotreated heavy paraffinic : Not available
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Not available
- Trade secret : Not available
- ar-Nonyl-N-(nonylphenyl)benzenamine : Not available
- N-Phenyl-1-naphthalamine : Not available
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : 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 for guinea-pigs. (read-aross: 64742-56-9) (OECD TG 406, GLP) (ECHA)
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Not available
- Trade secret : Not available
- ar-Nonyl-N- : guinea pig; not sensitising (OECD TG 406, GLP) (ECHA)

(nonylphenyl)benzenamine

- N-Phenyl-1-naphthalamine : guinea pig; sensitising (90 % of the animals were sensitized under the experimental conditions employed.) (OECD TG 406) (ECHA)
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not available

○ **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), catalytic reformer fractionator residue, low-boiling : EU CLP 1272/2008 : Carc. 2 (Note N : The classification as a carcinogen need not apply if it the full refining history is known and it can be shown that the substance from which it is produced is not a carcinogen. This notes applies only to certain complex oil-derived substances)
- Trade secret : Not available
- ar-Nonyl-N-(nonylphenyl)benzenamine : IARC, EU CLP 1272/2008, OSHA, ACGIH, US EPA IRIS, NTP : not listed
- N-Phenyl-1-naphthalamine : IARC, EU CLP 1272/2008, OSHA, ACGIH, US EPA IRIS, NTP : not listed
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not available

○ **Germ cell mutagenicity : Not classified**

- Distillates (petroleum), hydrotreated heavy paraffinic : In vitro bacterial reverse mutation assay: negative (equivalent or similar to guideline OECD TG 471) (ECHA)
  In vitro mammalian chromosome aberration test: negative (read-aross : 64742-53-6) (equivalent or similar to guideline OECD TG 473, GLP) (ECHA)
  In vivo micronucleus assay : negative (read-across : 64741-62-4, 64741-53-3) (equivalent or similar to guideline OECD TG 474) (ECHA)
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Not available
- Trade secret : Not available
- ar-Nonyl-N-(nonylphenyl)benzenamine : In vitro Bacterial Reverse Mutation Assay : negative (OECD TG 471) (read across: TK12340) (ECHA), In Vitro Mammalian Cell Gene Mutation Test : negative (OECD TG 476) (read across: 4,4-dioctyldiphenylamine) (ECHA)
  In vivo rodent dominant lethal assay : negative (OECD TG 478) (ECHA)
- N-Phenyl-1-naphthalamine : 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 rodent dominant lethal assay : negative (OECD TG 478) (ECHA)
- 2-Propenoic acid ethyl : Not available

ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate

○ **Reproductive toxicity : Not classified**

- Distillates (petroleum), hydrotreated heavy paraffinic : rat; screening for reproductive / developmental toxicity; 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), catalytic reformer fractionator residue, low-boiling : Not available
- Trade secret : Not available
- ar-Nonyl-N-(nonylphenyl)benzenamine : rat; 50, 150 and 500 mg/kg bw; The substance is not teratogenic and not embryotoxic in rats. It causes maternal toxicity at a dose level of 500 mg/kg bw. (OECD TG 414, GLP) (ECHA)
- N-Phenyl-1-naphthalamine : rat(male/female); 15, 50, 150 mg/kg bw/day; NOAEL = 150 mg/kg bw/day (no adverse effects, highest dose tested) (OECD TG 414, GLP) (ECHA)
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not available

○ **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), catalytic reformer fractionator residue, low-boiling : Not available
- Trade secret : Not available
- ar-Nonyl-N-(nonylphenyl)benzenamine : oral; rat(male/female); No compound related gross organ changes were observed. LD50 > 5000 ㎎/㎏ bw, no deaths (OECD TG 401) (ECHA)
  dermal; rat(male/female); Piloerection, abnormal body positions, and dyspnea were seen, being common symptoms in acute toxicity testing. The animals recovered within 9 days. LD50 > 2000 ㎎/㎏ bw (OECD TG 402) (ECHA)
  inhalation: aerosol; rat(male/female); Necropsy and histopathological examination revealed no substance-related findings. LC50 > 5.1 mg/L air /4h, no deaths (OECD TG 403) (ECHA)
- N-Phenyl-1-naphthalamine : dermal; rabbit(male); Livers congested and mottled; spleens dark; kidneys khaki

brown in colour. LD50 > 5000 mg/kg (OECD TG 401) (ECHA)

- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not available

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

- Distillates (petroleum), hydrotreated heavy paraffinic : 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. (read-aross : 64742-53-6) (OECD TG 410, GLP) (ECHA)
  Inhalation; rat; 4 weeks; 0, 50, 220 or 1000 mg/m3; 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. (equivalent or similar to guideline OECD TG 412) (ECHA)
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Not available
- Trade secret : Not available
- ar-Nonyl-N-(nonylphenyl)benzenamine : oral; rat(male); 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)
- N-Phenyl-1-naphthalamine : oral; rat(male/female); 5, 25, 125 mg/kg bw/day; The oral administration of the test item to Wistar rats over a period of 3 months revealed signs of systemic toxicity in male animals at a dose level of 25 mg/kg bw/d and above as well as in female animals at a dose level of 125 mg/kg bw/d taking pathology and hematology findings into account. However, no adverse neurobehavioral effects in male and female Wistar rats were observed at any dose level. In addition, no test substance related effects were observed during the neurohistopathology investigation at any dose level. Under the conditions of this study, the no observed adverse effect level (NOAEL) for systemic toxicity was 5 mg/kg bw/d in male and 25 mg/kg bw/d in female animals. The NOAEL for neurotoxicity was 125 mg/kg bw/d in male and female animals (highest dose tested). (OECD TG 409, GLP) (ECHA)
  Affected organs: kidney, blood system
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not available

○ Aspiration hazard : Not classified

- Distillates (petroleum), hydrotreated heavy paraffinic : Viscosity: 73.9 mm2/s (40°C)(ECHA) & hydrocarbons
- Distillates (petroleum), catalytic reformer fractionator residue, low- : Not available

boiling

- Trade secret : Not available
- ar-Nonyl-N-(nonylphenyl)benzenamine : 585 mPa.s at 40°C (ECHA) & not hydrocarbons
- N-Phenyl-1-naphthalamine : Not applicable
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not available

12. ECOLOGICAL INFORMATION

1) Ecotoxicity

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

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

Fish

- Distillates (petroleum), hydrotreated heavy paraffinic : 96h-LL50(Pimephales promelas) > 100 mg/L (OECD TG 203, GLP) (ECHA)
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Not available
- Trade secret : Not available
- ar-Nonyl-N-(nonylphenyl)benzenamine : No toxic effects up to the limit of water solubility (< 5 μg/L)
- N-Phenyl-1-naphthalamine : 96h-LC50(Oncorhynchus mykiss) = 0.44 mg/l (ECHA)
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not available

Invertebrates

- Distillates (petroleum), hydrotreated heavy paraffinic : 48h-EL50(Daphnia magna) > 10,000 mg/L (read across : 64742-53-6 or 64741-97-5) (equivalent or similar to guideline OECD TG 202) (ECHA)
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Not available
- Trade secret : Not available
- ar-Nonyl-N-(nonylphenyl)benzenamine : No toxic effects up to the limit of water solubility (< 5 μg/L)
- N-Phenyl-1-naphthalamine : 48h-EC50(Daphnia magna) = 0.3 mg/l (ECHA)
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not available

Aquatic algae

- Distillates (petroleum), hydrotreated heavy paraffinic : Not available
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Not available
- Trade secret : Not available
- ar-Nonyl-N-(nonylphenyl)benzenamine : No toxic effects up to the limit of water solubility (< 5 μg/L)
- N-Phenyl-1-naphthalamine : 96h-ErC50(Pseudokirchneriella subcapitata) = 0.93 mg/L (ECHA)
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not available

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

Fish

- Distillates (petroleum), hydrotreated heavy paraffinic : Not available
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Not available
- Trade secret : Not available

- ar-Nonyl-N-(nonylphenyl)benzenamine : Not available
- N-Phenyl-1-naphthalamine : Not available
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not available

Invertebrates

- Distillates (petroleum), hydrotreated heavy paraffinic : 21d-NOEL(Daphnia magna)=10 mg/L (read across: 64742-53-6) (equivalent or similar to guideline OECD TG 211, GLP) (ECHA)
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Not available
- Trade secret : Not available
- ar-Nonyl-N-(nonylphenyl)benzenamine : Not available
- N-Phenyl-1-naphthalamine : 21d-NOEC(Daphnia magna) = 0.02 mg/L (US EPA) (ECHA)
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not available

Aquatic algae

- Distillates (petroleum), hydrotreated heavy paraffinic : 72h-NOErL(Pseudokirchnerella subcapitata) >= 100 mg/L (read across: 72623-87-1) (OECD TG 201) (ECHA)
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Not available
- Trade secret : Not available
- ar-Nonyl-N-(nonylphenyl)benzenamine : Not available
- N-Phenyl-1-naphthalamine : Not available
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not available

2) Persistence and degradability

○ **Persistence**

- Distillates (petroleum), hydrotreated heavy paraffinic : This substance is UVCB, so it is not applicable. (ECHA)
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Not available
- Trade secret : Not available
- ar-Nonyl-N-(nonylphenyl)benzenamine : log Kow=12.24 (estimated) (EPISUITE); not valid (over -4<log Kow<8)
- N-Phenyl-1-naphthalamine : log Kow = 4.28 (ECHA)
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not available

○ **Degradability**

- Distillates (petroleum), hydrotreated heavy paraffinic : The chemical constituents that comprise the other lubricant base oils category consist entirely of carbon and hydrogen and do not contain hydrolyzable groups. As such, they have a very low potential to hydrolyze. Therefore, this degradative process will not contribute to their removal from the environment. (ECHA)
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Not available
- Trade secret : Not available
- ar-Nonyl-N-(nonylphenyl)benzenamine : In contact with water no hydrolysis is expected. (ECHA)
- N-Phenyl-1-naphthalamine : Not available
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not available

3) Bioaccumulative potential

○ **Bioaccumulation**

- Distillates (petroleum), hydrotreated heavy paraffinic : This substance is UVCB, so it is not applicable. (ECHA)
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Not available
- Trade secret : Not available
- ar-Nonyl-N-(nonylphenyl)benzenamine : BCF=35.87 (estimated) (EPISUITE)
- N-Phenyl-1-naphthalamine : BCF = 274.3 (estimated) (EPISUITE)

- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not available

○ **Biodegradation**

- Distillates (petroleum), hydrotreated heavy paraffinic : Another lubricant base oil, Solvent Neutral 600 Base Oil (MRD-94 -981), was determined to be inherently biodegradable but not readily biodegradable with a mean degradation of 31.13% by day 28. (read across: Solvent Neutral 600 Base Oil (MRD-94-981)) (OECD TG 301F, GLP) (ECHA)
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Not available
- Trade secret : Not available
- ar-Nonyl-N-(nonylphenyl)benzenamine : 1% degradation after 28 days; under test conditions no biodegradation observed (OECD TG 301B, GLP) (read across: TK12340) (ECHA)
- N-Phenyl-1-naphthalamine : 0 % degradation after 28 days; under test conditions no biodegradation observed (OECD TG 301C, GLP) (ECHA)
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not available

4) Mobility in soil

- Distillates (petroleum), hydrotreated heavy paraffinic : Not available
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Not available
- Trade secret : Not available
- ar-Nonyl-N-(nonylphenyl)benzenamine : Koc=44900000 (EPISUITE)
- N-Phenyl-1-naphthalamine : Koc = 1685 (EPISUITE)
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not available

5) Hazard to the ozone layer

- Distillates (petroleum), hydrotreated heavy paraffinic : Not applicable
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Not applicable
- Trade secret : Not available
- ar-Nonyl-N-(nonylphenyl)benzenamine : Not applicable
- N-Phenyl-1-naphthalamine : Not applicable
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not available

6) Other adverse effects

- Distillates (petroleum), hydrotreated heavy paraffinic : Not available
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Not available
- Trade secret : Not available
- ar-Nonyl-N-(nonylphenyl)benzenamine : Not available
- N-Phenyl-1-naphthalamine : Not available
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not available

13. DISPOSAL CONSIDERATIONS

1) Disposal methods

- Not available

2) Special precaution for disposal

- The user of this product must disposal by oneself or entrust to waste disposer or person who other's waste recycle and dispose, person who establish and operate waste disposal facilities.
- Dispose of waste in accordance with all applicable laws and regulations.

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)

- Distillates (petroleum), hydrotreated heavy paraffinic : European EINECS phase-in substance
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : European EINECS phase-in substance
- Trade secret : Not applicable
- ar-Nonyl-N-(nonylphenyl)benzenamine : European EINECS phase-in substance
- N-Phenyl-1-naphthalamine : European EINECS phase-in substance
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not applicable

EU CLP (CLASSIFICATION) - PRODUCT : Not applicable

- Distillates (petroleum), hydrotreated heavy paraffinic : Not applicable
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Not applicable
- Trade secret : Not applicable
- ar-Nonyl-N-(nonylphenyl)benzenamine : Not applicable
- N-Phenyl-1-naphthalamine : Not applicable
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not applicable

Substances restricted under REACH

- Distillates (petroleum), hydrotreated heavy paraffinic : Substances restricted under REACH
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Substances restricted under REACH
- Trade secret : Not applicable
- ar-Nonyl-N-(nonylphenyl)benzenamine : Not applicable
- N-Phenyl-1-naphthalamine : Not applicable
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not applicable

Substances subject to authorization under REACH

REACH SVHC List

Korea

○ **Occupational Safety and Health Act**

- Distillates (petroleum), hydrotreated heavy paraffinic : Substance subject to occupational exposure limits, Harmful agents subject to work environment monitoring, Harmful agents subject to workers requiring health examination
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Not applicable
- Trade secret : Not applicable
- ar-Nonyl-N-(nonylphenyl)benzenamine : Not applicable
- N-Phenyl-1-naphthalamine : Not applicable
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not applicable

○ **K-REACH**

- Distillates (petroleum), hydrotreated heavy paraffinic : Not applicable
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Not applicable
- Trade secret : Not applicable
- ar-Nonyl-N-(nonylphenyl)benzenamine : Not applicable
- N-Phenyl-1-naphthalamine : Phase-in Substances subject to Registration
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not applicable

○ **Chemical Control Act in Korea**

- Distillates (petroleum), hydrotreated heavy paraffinic : Not applicable
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Not applicable
- Trade secret : Not applicable
- ar-Nonyl-N-(nonylphenyl)benzenamine : Not applicable
- N-Phenyl-1-naphthalamine : Ecologically hazardous substances
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not applicable

○ **Safety Control of Dangerous Substances Act**

- Distillates (petroleum), hydrotreated heavy paraffinic : Dangerous substance
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Not applicable
- Trade secret : Not applicable
- ar-Nonyl-N-(nonylphenyl)benzenamine : Not applicable
- N-Phenyl-1-naphthalamine : Not applicable
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not applicable

U.S.A

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

- Distillates (petroleum), hydrotreated heavy paraffinic : Not applicable
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Not applicable
- Trade secret : Not applicable
- ar-Nonyl-N-(nonylphenyl)benzenamine : Not applicable
- N-Phenyl-1-naphthalamine : Not applicable
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not applicable

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

- Distillates (petroleum), hydrotreated heavy paraffinic : Not applicable
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Not applicable
- Trade secret : Not applicable
- ar-Nonyl-N-(nonylphenyl)benzenamine : Not applicable
- N-Phenyl-1-naphthalamine : Not applicable
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not applicable

○ **CERCLA Section 302 regulation**

- Distillates (petroleum), hydrotreated heavy paraffinic : Not applicable
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Not applicable
- Trade secret : Not applicable
- ar-Nonyl-N-(nonylphenyl)benzenamine : Not applicable
- N-Phenyl-1-naphthalamine : Not applicable
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not applicable

○ **CERCLA Section 304 regulation**

- Distillates (petroleum), hydrotreated heavy paraffinic : Not applicable
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Not applicable
- Trade secret : Not applicable
- ar-Nonyl-N-(nonylphenyl)benzenamine : Not applicable
- N-Phenyl-1-naphthalamine : Not applicable
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not applicable

○ **CERCLA Section 313 regulation**

- Distillates (petroleum), hydrotreated heavy paraffinic : Not applicable
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Not applicable
- Trade secret : Not applicable
- ar-Nonyl-N-(nonylphenyl)benzenamine : Not applicable
- N-Phenyl-1-naphthalamine : Not applicable
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not applicable

Interntional Convention on Environment

○ **Rotterdam Convention list**

- Distillates (petroleum), hydrotreated heavy paraffinic : Not applicable
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Not applicable
- Trade secret : Not applicable
- ar-Nonyl-N-(nonylphenyl)benzenamine : Not applicable
- N-Phenyl-1-naphthalamine : Not applicable
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not applicable

○ **Stockholm Convention list**

- Distillates (petroleum), hydrotreated heavy paraffinic : Not applicable
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Not applicable
- Trade secret : Not applicable
- ar-Nonyl-N-(nonylphenyl)benzenamine : Not applicable
- N-Phenyl-1-naphthalamine : Not applicable
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not applicable

○ **Montreal Protocol list**

- Distillates (petroleum), hydrotreated heavy paraffinic : Not applicable
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Not applicable
- Trade secret : Not applicable
- ar-Nonyl-N-(nonylphenyl)benzenamine : Not applicable
- N-Phenyl-1-naphthalamine : Not applicable
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not applicable

National Inventory

○ **Korea**

- Distillates (petroleum), hydrotreated heavy paraffinic : Not applicable
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Not applicable
- Trade secret : Not applicable
- ar-Nonyl-N-(nonylphenyl)benzenamine : Not applicable
- N-Phenyl-1-naphthalamine : Not applicable
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not applicable

○ **U.S.A**

- Distillates (petroleum), hydrotreated heavy paraffinic : US TSCA phase-in substance
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : US TSCA phase-in substance
- Trade secret : Not applicable
- ar-Nonyl-N-(nonylphenyl)benzenamine : US TSCA phase-in substance
- N-Phenyl-1-naphthalamine : US TSCA phase-in substance
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not applicable

○ **China**

- Distillates (petroleum), hydrotreated heavy paraffinic : China phase-in substance
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : China phase-in substance
- Trade secret : Not applicable
- ar-Nonyl-N-(nonylphenyl)benzenamine : China phase-in substance
- N-Phenyl-1-naphthalamine : China phase-in substance
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : Not applicable

○ **Japan**

- Distillates (petroleum), hydrotreated heavy paraffinic : Not applicable
- Distillates (petroleum), catalytic reformer fractionator residue, low-boiling : Not applicable
- Trade secret : Not applicable
- ar-Nonyl-N-(nonylphenyl)benzenamine : Japan ENCS phase-in substance
- N-Phenyl-1-naphthalamine : Japan ENCS phase-in substance
- 2-Propenoic acid ethyl ester polymer with alkyl(C=1~7) alkyl(C=1~11) alkenoate : 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

- 2018-01-01

3) Revision number and Last date revised

○ **Number of revised**

- 2

○ **Date of last revision**

- 2026-01-05

○ **Last Revision History**

- Reflection of the 2025-year notices from Ministry of Employment and Labor and National Institute of Chemical Safety

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.