



Material Safety Data Sheet (MSDS)

Product	Kixx PAO C3 5W-30		
Team	Date of first preparation	Date of last revision	Revision Number
Finished Lubricants R&D Team	2015-09-15	2017-10-26	2

1. Chemical Product and Company Information

- 1) Product : Kixx PAO C3 5W-30
- 2) Recommended use of the chemical and restrictions on use
 - Recommended use : Internal combustion diesel engine
 - Restrictions on use :
- 3) Manufacture/Supplier information
 - Supply company : GS Caltex Corporation
 - Address : Nonhyeon-ro 508(Yeoksam-dong), Gangnam-gu, Seoul, South Korea
 - Information service or emergency call : 82-2-1899-5145
 - Department in charge : Finished Lubricants R&D Team

2. Hazards Identification

- 1) Classification of the substance or mixture
 - Not hazardous
- 2) GHS labels, including precautionary statements
 - Symbol : No symbol
 - Signal word : No signal word
 - Hazard statement
 - Not classified under GHS criteria
 - Precautionary statement
 - Prevention
 - No precautionary phrases
 - Response
 - No precautionary phrases
 - Storage
 - No precautionary phrases
 - Disposal
 - No precautionary phrases
- 3) Other hazards which do not result in classification

Component	NFPA	Health	Fire	Reactivity
1. Distillates, Hydrotreated Heavy Paraffinic		0	1	0
2. Hydrogenated Decene Homopolymer		1	1	0
3. Additive mixture (S1)		1	1	0

4. Styrene Butadiene Copolymer	1	1	0
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3. Composition and Information on Ingredients

Component	Synonyms	CAS No.	Content(%)
1. Distillates, Hydrotreated Heavy Paraffinic	Hydrotreated (severe) heavy paraffinic distillate	64742-54-7	60 ~ 70
2. Hydrogenated Decene Homopolymer	Saturated Olefin Hydrocarbons	68037-01-4	5 ~ 8
3. Additive mixture (S1)	Not Applicable	Not Determined	12 ~ 15
4. Styrene Butadiene Copolymer	Ethenylbenzene polymer with 1,3-butadiene	9003-55-8	10 ~ 20

4. First Aid Measures

- 1) Eye contact :
 - Wash eyes thoroughly with plenty of water for at least 20 minutes. If persistent irritation occurs, obtain medical attention.
- 2) Skin contact :
 - Remove contaminated clothing and wash skin with plenty of soap and water. Flush with plenty of water for 15 minutes. Seek medical attention if ill effect or irritation develops.
- 3) Inhalation :
 - If overcome by exposure, remove person to fresh air immediately.
 - Give oxygen or artificial respiration as needed.
 - Obtain emergency medical attention. Prompt action is essential.
- 4) Ingestion :
 - Do not induce vomiting. In general no treatment is necessary unless large quantities are swallowed.
 - Obtain emergency medical attention. Prompt action is essential.
- 5) Most important symptoms/effects, acute and delayed :
 - May cause slight eye and skin irritation. Not expected to be a sensitizer.
- 6) First-aid treatment and information on medical doctors :
 - Treat symptomatically.
 - Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.

5. Fire Fighting Measures

- 1) Recommended(or prohibited) extinguishing media
 - Recommended extinguishing media :
 - Dry chemicals, CO2, water spray, fire fighting foam
 - Prohibited extinguishing media :
 - High pressure water shoot
 - Large fire :
 - Use water spray, water fog or alcohol-resistant foam

2) Specific hazard from chemical material

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

3) Extinguishment :

If it is not dangerous, remove containers from fire areas.

Make hills for further treatment.

avoid Inhalation of material oneself or combustion generation material

Stand against the wind and avoid lower zone.

6. Accidental Release Measures

1) Necessary actions to protect human health :

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

Wear protective gloves, apron, boots, head and face protection should be worn, If need.

Keep away from water supply facilities and sewage.

Avoid inhalation of materials or combustion products.

Avoid heat, flame, spark, and other ignition sources.

2) Necessary actions to protect the environment

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

Equip responders with proper protection.

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

Restrict water use for cleanup.

3) Purification and removal methods

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

Collect spills with proper containers to treat them.

Absorb spills with sand and other non-combustible materials.

- Large leak : No data

7. Handling and Storage

1) Safety handling :

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

Prevent small spills and leakage to avoid slip hazard. Avoid inhaling vapour and/or mists.

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

2) Storage :

Storage in closed containers.

Storage in cool and dry areas.

Ventilation keeps it in a region

Keep away from prohibited materials for mixing.

8. Exposure Control and Personal Protection

A. Exposure limits and biological exposure limits of chemical

1) Distillates, Hydrotreated Heavy Paraffinic

- ACGIH : TWA : 5mg/m³

STEL : 10mg/m³

- NIOSH : TWA : 5mg/m³

STEL : 10mg/m³

Biological exposure limits : No data

2) Hydrogenated Decene Homopolymer

ACGIH : TWA : 5mg/m³

STEL : 10mg/m³

NIOSH : TWA : 5mg/m³

STEL : 10mg/m³

Biological exposure limits : No data

3) Additive mixture (S1)

ACGIH : No data

Biological exposure limits : No data

4) Styrene Butadiene Copolymer

ACGIH : No data

Biological exposure limits : No data

B. Engineering management :

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

C. Personal protection equipment :

Respiratory protection :

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

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

Eyes protection :

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

Hands protection :

Use proper chemical resistant gloves.

Human body protection :

Use proper chemical resistant clothes.

9. Physical and Chemical Properties

1) Appearance : Clear, light yellow liquid

2) Odor : a specific smell of Hydrocarbon

3) Odor threshold : No data

4) pH : No data

5) Melting point/freezing point : No data

6) Initial boiling point or boiling range : > 280 °C

7) Flash point : 232 °C (C.O.C)

8) Evaporation rate (BuAc=1) : No data

9) Flammability(solid, gas) : No data

- 10) Upper/lower flammability or explosive limits : No data
- 11) Vapor pressure : <0.1 Kpa @ 20°C
- 12) Solubility : No data
- 13) Vapor density : 5 mmHg
- 14) Relative density : 0.855
- 15) Partition coefficient: n-octano/water : No data
- 16) Auto-ignition temperature : No data
- 17) Decomposition temperature : No data
- 18) Viscosity : 11.15cSt(100°C)
- 19) Molecular weight : No data

10. Stability and Reactivity

- 1) Chemical stability :
 - Stable at room temperature and pressure.
- 2) Toxicant generation possibility during reaction :
 - No data
- 3) Prohibited conditions :
 - Avoid heat, sparks, open flames and other ignition sources
- 4) Prohibited materials :
 - An Oxidizing agent
- 5) Toxicant during decomposition :
 - Carbon oxides, Hydrogen sulfide

11. Toxicological Information

A. Information on the likely routes of exposure

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

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

1) Distillates, Hydrotreated Heavy Paraffinic

- Acute oral toxicity
 - Oral : LD50 > 5000mg/bw Rat
 - Dermal : LD50 > 2000mg/bw Rabbit
 - Inhalation : LC50 = 50mg/L (4hr) Rat
- Skin corrosion/irritation : No irritating (Rabbit)
- Serious eye damage/eye irritation : No irritating (Rabbit)

- Respiratory sensitization : Not determined (guinea pig)
- Skin sensitization : Not determined (guinea pig)
- Carcinogenicity : MOL, OSHA, IARC : No data
- Germ cell mutagenicity : Negative (Ames test)
- Reproductive toxicity : No data
- Specific target organ systemic toxicity(single exposure) : No data
- Specific target organ systemic toxicity(repeated exposure) : No data
- Aspiration hazard : No data

2) Hydrogenated Decene Homopolymer

- Acute oral toxicity
 - Oral : LD50 > 5000mg/bw Rat
 - Dermal : LD50 > 5000mg/bw Rabbit
 - Inhalation : LC50 = 50mg/L (4hr) Rat
- Skin corrosion/irritation : No irritating (Rabbit)
- Serious eye damage/eye irritation : No irritating (Rabbit)
- Respiratory sensitization : Not determined (guinea pig)
- Skin sensitization : Not determined (guinea pig)
- Carcinogenicity : MOL, OSHA, IARC : No data
- Germ cell mutagenicity : Negative (Ames test)
- Reproductive toxicity : No data
- Specific target organ systemic toxicity(single exposure) : No data
- Specific target organ systemic toxicity(repeated exposure) : No data
- Aspiration hazard : No data

3) Additive mixture (S1)

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

4) Styrene Butadiene Copolymer

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

- Specific target organ systemic toxicity(repeated exposure) : No data
- Aspiration hazard : No data

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

12. Ecological Information

A. Hazardous to the aquatic environment :

1) Distillates, Hydrotreated Heavy Paraffinic

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

2) Hydrogenated Decene Homopolymer

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

3) Additive mixture (S1)

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

4) Styrene Butadiene Copolymer

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

B. Persistence and degradability :

1) Distillates, Hydrotreated Heavy Paraffinic

– No data

2) Hydrogenated Decene Homopolymer

– No data

3) Additive mixture (S1)

– No data

4) Styrene Butadiene Copolymer

– No data

C. Bioaccumulative potential

1) Distillates, Hydrotreated Heavy Paraffinic

– Bioaccumulation : 6% (28 day, aerotropism, domestic waste water, not disassemble)

2) Hydrogenated Decene Homopolymer

– No data

3) Additive mixture (S1)

– No data

4) Styrene Butadiene Copolymer

– No data

D. Mobility in soil :

1) Distillates, Hydrotreated Heavy Paraffinic

– Expected to have mobility in soils.

2) Hydrogenated Decene Homopolymer

– No data

3) Additive mixture (S1)

– No data

- 4) Styrene Butadiene Copolymer
 - No data

- E. Other adverse effects :
 - No data

13. Disposal Considerations

- 1) Disposal methods :
 - Use only licensed transporters and permitted facilities for waste disposal.
- 2) Disposal cautions :
 - Dispose according to the related regulations

14. Transport Information

This product is not regulated for carriage according to ADR/RID, ADN, IMDG, ICAO/IATA.

- 1) UN number : Not applicable
- 2) UN Proper Shipping Name : Not applicable
- 3) Transport hazard classes : Not applicable
- 4) Packing group, if applicable : Not applicable
- 5) Environmental hazards : Not applicable
- 6) Special precautions for user : Not applicable
- 7) This product is NOT classified as dangerous for IATA Transport

15. Regulatory Information

- A. Industrial safety and health act (Korea)
 - Occupation environment measurement material, Special health examination material, Threshold limit values material
- B. Chemical control act (Korea)
 - Distillates, Hydrotreated Heavy Paraffinic : No data
 - Hydrogenated Decene Homopolymer : No data
 - Additive mixture (S1) : No data
 - Styrene Butadiene Copolymer : toxic material
- C. Dangerous Goods Safe Control Act (Korea)
 - Category 4 Dangerous Goods (Flammable Liquids), Grade 4 petroleum chemicals
- D. Hazardous material safety act (Korea)
 - Distillates, Hydrotreated Heavy Paraffinic : No data
 - Hydrogenated Decene Homopolymer : No data
 - Additive mixture (S1) : No data

- Styrene Butadiene Copolymer : toxic material

E. Other internal and foreign acts

1) Distillates, Hydrotreated Heavy Paraffinic

EU classification

- Classification : Carc. Cat. 2
- Risk Phrases : R45
- Safety Phrases : S45, S53

U.S. acts

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

2) Hydrogenated Decene Homopolymer

EU classification

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

U.S. acts

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

3) Additive mixture (S1)

EU classification

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

U.S. acts

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

4) Styrene Butadiene Copolymer

EU classification

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

U.S. acts

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

1) References

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

2) Date of preparation of the first version of the MSDS : 2015.09.15

3) Revised frequency and Date of preparation of the latest version of the MSDS : 2017-10-26 (2)

4) Others :

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

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

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

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

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



Material Safety Data Sheet (MSDS)

Product	Kixx PAO C3 5W-40
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Team	Date of first preparation	Date of last revision	Revision Number
Finished Lubricants R&D Team	2015-10-24	2017-10-26	2

1. Chemical Product and Company Information

- 1) Product : Kixx PAO C3 5W-40
- 2) Recommended use of the chemical and restrictions on use
 - Recommended use : Lubricants, Gasoline Engine Oil
 - Restrictions on use :
- 3) Manufacture/Supplier information
 - Supply company : GS Caltex Corporation
 - Address : Nonhyeon-ro 508(Yeoksam-dong), Gangnam-gu, Seoul, South Korea
 - Information service or emergency call : 82-2-1899-5145
 - Department in charge : Finished Lubricants R&D Team

2. Hazards Identification

- 1) Classification of the substance or mixture
 - Not hazardous
- 2) GHS labels, including precautionary statements
 - Symbol : No symbol
 - Signal word : No signal word
 - Hazard statement
 - Not classified under GHS criteria
 - Precautionary statement
 - Prevention
 - No precautionary phrases
 - Response
 - No precautionary phrases
 - Storage
 - No precautionary phrases
 - Disposal
 - No precautionary phrases
- 3) Other hazards which do not result in classification

Component	NFPA		
	Health	Fire	Reactivity
1. Distillates, Hydrotreated Heavy Paraffinic	0	1	0
2. Hydrogenated Decene Homopolymer	1	1	0
3. Additive mixture (S1)	1	1	0

4. Styrene Butadiene Copolymer	1	1	0
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3. Composition and Information on Ingredients

Component	Synonyms	CAS No.	Content(%)
1. Distillates, Hydrotreated Heavy Paraffinic	Hydrotreated (severe) heavy paraffinic distillate	64742-54-7	60 ~ 70
2. Hydrogenated Decene Homopolymer	Saturated Olefin Hydrocarbons	68037-01-4	5 ~ 10
3. Additive mixture (S1)	Not Applicable	Not Determined	10 ~ 15
4. Styrene Butadiene Copolymer	Ethenylbenzene polymer with 1,3-butadiene	9003-55-8	10 ~ 20

4. First Aid Measures

- 1) Eye contact :
 - Wash eyes thoroughly with plenty of water for at least 20 minutes.
- 2) Skin contact :
 - Remove contaminated clothing and wash skin with plenty of soap and water. Flush with plenty of water for 15 minutes.
 - Seek medical attention if ill effect or irritation develops.
- 3) Inhalation :
 - If overcome by exposure, remove person to fresh air immediately.
 - Give oxygen or artificial respiration as needed.
 - Obtain emergency medical attention. Prompt action is essential.
- 4) Ingestion :
 - Do not induce vomiting. Obtain emergency medical attention. Prompt action is essential.
- 5) Most important symptoms/effects, acute and delayed :
 - May cause slight eye and skin irritation. Not expected to be a sensitizer.
- 6) First-aid treatment and information on medical doctors :
 - Treat symptomatically.
 - Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.

5. Fire Fighting Measures

- 1) Recommended(or prohibited) extinguishing media
 - Recommended extinguishing media :
 - Dry chemicals, CO₂, water spray, fire fighting foam
 - Prohibited extinguishing media :

- High pressure water shoot
- Large fire :
 - fire fighting foam or water spray
- 2) Specific hazard from chemical material
 - Toxicant from combustion : Carbon oxides
 - Fire and Explosion Hazards: Slight fire risk
- 3) Extinguishment :
 - If it is not dangerous, remove containers from fire areas.
 - Make hills for further treatment.
 - avoid Inhalation of material oneself or combustion generation material
 - Stand against the wind and avoid lower zone.

6. Accidental Release Measures

- 1) Necessary actions to protect human health :
 - If it is not dangerous, stop release safely, do so.
 - Keep away from water supply facilities and sewage.
 - Avoid inhalation of materials or combustion products
 - Avoid heat, flame, spark, and other ignition sources.
- 2) Necessary actions to protect the environment
 - May contaminate water supplies/pollute public waters. Evacuate/limit access.
 - Equip responders with proper protection.
 - Prevent flow to sewer/public waters. Stop release. Notify fire and environmental authorities.
 - Restrict water use for cleanup.
- 3) Purification and removal methods
 - Small leak : Only authorized person can access to the hazardous and restricted areas.
 - Collect spills with proper containers to treat them.
 - Absorb spills with sand and other non-combustible materials.
 - Large leak : No data

7. Handling and Storage

- 1) Safety handling :
 - Avoid contact with skin. Use proper bonding and/or grounding procedures.
 - Prevent small spills and leakage to avoid slip hazard.
 - Material can accumulate static charges which may cause an electrical spark (ignition source).
- 2) Storage :
 - Storage in closed containers.
 - Storage in cool and dry areas.
 - Ventilation keeps it in a region
 - Keep away from prohibited materials for mixing.

8. Exposure Control and Personal Protection

A. Exposure limits and biological exposure limits of chemical

1) Distillates, Hydrotreated Heavy Paraffinic

- ACGIH : TWA : 5mg/m³
 STEL : 10mg/m³
- NIOSH : TWA : 5mg/m³
 STEL : 10mg/m³
- Biological exposure limits : No data

2) Hydrogenated Decene Homopolymer

- ACGIH : TWA : 5mg/m³
 STEL : 10mg/m³
- NIOSH : TWA : 5mg/m³
 STEL : 10mg/m³
- Biological exposure limits : No data

3) Long Chain Alkaryl Amine

- ACGIH : No data
- Biological exposure limits : No data

4) Zinc dithiophosphate

- ACGIH : No data
- Biological exposure limits : No data

5) Additive mixture (S1)

- ACGIH : No data
- Biological exposure limits : No data

B. Engineering management :

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

Install local ventilation system.

Comply with limits.

C. Personal protection equipment :

Respiratory protection :

If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include: Half-face filter respirator

Eyes protection :

Safety glasses or goggles are recommended for the eyes protection from dusts or mists. A business proprietor should install eyes washing facilities near working areas to protect worker's eyes for emergency.

Hands protection :

Use proper chemical resistant gloves.

Human body protection :

Use proper chemical resistant clothes.

9. Physical and Chemical Properties

- 1) Appearance : Clear, light yellow liquid
- 2) Odor : a specific smell of Hydrocarbon
- 3) Odor threshold : No data
- 4) pH : No data
- 5) Melting point/freezing point : No data
- 6) Initial boiling point or boiling range : No data
- 7) Flash point : 232°C (C.O.C)
- 8) Evaporation rate (BuAc=1) : No data
- 9) Flammability(solid, gas) : No data
- 10) Upper/lower flammability or explosive limits : No data
- 11) Vapor pressure : <0.1 Kpa @ 20°C
- 12) Solubility : No data
- 13) Vapor density : No data
- 14) Relative density : 0.8548 Kg/L @ 15°C
- 15) Partition coefficient: n-octano/water : No data
- 16) Auto-ignition temperature :> 260°C
- 17) Decomposition temperature : No data
- 18) Viscosity : 15.0 cSt @ 100°C
- 19) Molecular weight : No data

10. Stability and Reactivity

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

11. Toxicological Information

A. Information on the likely routes of exposure

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

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

1) Distillates, Hydrotreated Heavy Paraffinic

- Acute oral toxicity
 - Oral : LD50 > 5000mg/bw Rat
 - Dermal : LD50 > 2000mg/bw Rabbit
 - Inhalation : LC50 = 50mg/L (4hr) Rat
- Skin corrosion/irritation : No irritating (Rabbit)
- Serious eye damage/eye irritation : No irritating (Rabbit)
- Respiratory sensitization : Not determined (guinea pig)
- Skin sensitization : Not determined (guinea pig)
- Carcinogenicity : MOL, OSHA, IARC : No data
- Germ cell mutagenicity : Negative (Ames test)
- Reproductive toxicity : No data
- Specific target organ systemic toxicity(single exposure) : No data
- Specific target organ systemic toxicity(repeated exposure) : No data
- Aspiration hazard : No data

2) Hydrogenated Decene Homopolymer

- Acute oral toxicity
 - Oral : LD50 > 5000mg/bw Rat
 - Dermal : LD50 > 5000mg/bw Rabbit
 - Inhalation : LC50 = 50mg/L (4hr) Rat
- Skin corrosion/irritation : No irritating (Rabbit)
- Serious eye damage/eye irritation : No irritating (Rabbit)
- Respiratory sensitization : Not determined (guinea pig)
- Skin sensitization : Not determined (guinea pig)
- Carcinogenicity : MOL, OSHA, IARC : No data
- Germ cell mutagenicity : Negative (Ames test)
- Reproductive toxicity : No data
- Specific target organ systemic toxicity(single exposure) : No data
- Specific target organ systemic toxicity(repeated exposure) : No data
- Aspiration hazard : No data

3) Long Chain Alkaryl Amine

- Acute oral toxicity
 - Oral : LD50 > 5000mg/bw Rat
 - Dermal : LD50 > 5000mg/bw Rabbit
 - Inhalation : LC50 = 50mg/L (4hr) Rat
- Skin corrosion/irritation : No irritating (Rabbit)
- Serious eye damage/eye irritation : No irritating (Rabbit)
- Respiratory sensitization : Not determined (guinea pig)
- Skin sensitization : Not determined (guinea pig)
- Carcinogenicity : MOL, OSHA, IARC : No data
- Germ cell mutagenicity : Negative (Ames test)
- Reproductive toxicity : No data

- Specific target organ systemic toxicity(single exposure) : No data
- Specific target organ systemic toxicity(repeated exposure) : No data
- Aspiration hazard : No data

4) Zinc dithiophosphate

- Acute oral toxicity
 - Oral : LD50> 5000mg/kg (rat)
 - Dermal : LD50> 5000mg/kg (rabbit)
 - Inhalation : LC50 = 50mg/L (4hr) Rat
- Skin corrosion/irritation : No irritating (Rabbit)
- Serious eye damage/eye irritation : No irritating (Rabbit)
- Respiratory sensitization : Not determined (guinea pig)
- Skin sensitization : Not determined (guinea pig)
- Carcinogenicity : MOL, OSHA, IARC : No data
- Germ cell mutagenicity : Negative (Ames test)
- Reproductive toxicity : No data
- Specific target organ systemic toxicity(single exposure) : No data
- Specific target organ systemic toxicity(repeated exposure) : No data
- Aspiration hazard : No data

3) Additive mixture (S1)

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

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

12. Ecological Information

A. Hazardous to the aquatic environment :

1) Distillates, Hydrotreated Heavy Paraffinic

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

2) Hydrogenated Decene Homopolymer

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

3) Long Chain Alkaryl Amine

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

4) Zinc dithiophosphate

- Fish : No data
- Crustacea : No data
- Algea : No data

5) Additive mixture (S1)

- Fish : No data
- Crustacea : No data
- Algea : No data

B. Persistence and degradability :

1) Distillates, Hydrotreated Heavy Paraffinic

- No data

2) Hydrogenated Decene Homopolymer

- No data

3) Long Chain Alkaryl Amine

- No data

4) Zinc dithiophosphate

- No data

5) Additive mixture (S1)

- No data

C. Bioaccumulative potential

1) Distillates, Hydrotreated Heavy Paraffinic

- Bioaccumulation : 6% (28 day, aerotropism, domestic waste water, not disassemble)

2) Hydrogenated Decene Homopolymer

- No data

3) Long Chain Alkaryl Amine

- No data

4) Zinc dithiophosphate

- No data

5) Additive mixture (S1)

- No data

D. Mobility in soil :

1) Distillates, Hydrotreated Heavy Paraffinic

- Expected to have mobility in soils.

2) Hydrogenated Decene Homopolymer

- No data

3) Long Chain Alkaryl Amine

- No data

4) Zinc dithiophosphate

- No data

5) Additive mixture (S1)

- No data

E. Other adverse effects :

- No data

13. Disposal Considerations

1) Disposal methods :

Use only licensed transporters and permitted facilities for waste disposal.

2) Disposal cautions :

Dispose according to the related regulations

14. Transport Information

This product is not regulated for carriage according to ADR/RID, ADN, IMDG, ICAO/IATA.

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

15. Regulatory Information

A. Industrial safety and health act (Korea)

Occupation environment measurement material, Special health examination material,
Threshold limit values material

B. Chemical control act (Korea)

- Distillates, Hydrotreated Heavy Paraffinic : No data
- Hydrogenated Decene Homopolymer : No data
- Long Chain Alkaryl Amine : No data
- Zinc dithiophosphate : toxic material
- Additive mixture (S1) : No data

C. Dangerous Goods Safe Control Act (Korea)

Category 4 Dangerous Goods (Flammable Liquids), Grade 4 petroleum chemicals

D. Hazardous material safety act (Korea)

- Distillates, Hydrotreated Heavy Paraffinic : No data
- Hydrogenated Decene Homopolymer : No data
- Long Chain Alkaryl Amine : No data
- Zinc dithiophosphate : toxic material
- Additive mixture (S1) : No data

E. Other internal and foreign acts

1) Distillates, Hydrotreated Heavy Paraffinic

○ EU classification

- Classification : Carc. Cat. 2
- Risk Phrases : R45
- Safety Phrases : S45, S53

○ U.S. acts

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

2) Hydrogenated Decene Homopolymer

EU classification

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

U.S. acts

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

3) Long Chain Alkaryl Amine

EU classification

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

U.S. acts

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

4) Zinc dithiophosphate

EU classification

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

U.S. acts

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

5) Additive mixture (S1)

EU classification

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

U.S. acts

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

16. Other Information

1) References

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

2) Date of preparation of the first version of the MSDS : 2015.10.24

3) Revised frequency and Date of preparation of the latest version of the MSDS : 2017-10-26 (2)

4) Others :

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

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

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

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

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