Material Safety Data Sheet
(MSDS)

Product	Kixx HD CF-4 5W-30

Team	Date of first preparation	Date of last revision	Revision Number
Finished Lubricants R&D Team	2012-11-30	2017-10-26	3

1. Chemical Product and Company Information

1) Product : Kixx HD CF-4 5W-30

2) Recommended use of the chemical and restrictions on use
- ○ Recommended use : Internal combustion 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
- Distillates, Hydrotreated Heavy Paraffinic	0	1	0
- Calcium branched chain alkyl phenate sulfide	1	1	0
- Polyolefin polyamine succinimide, polyol	1	1	0
- Additive mixture (S1)	1	1	0
- Olefin copolymer	0	1	0

3. Composition and Information on Ingredients

Component	Synonyms	CAS No.	Content(%)
1) Distillates, Hydrotreated Heavy Paraffinic	Hydrotreated (severe) heavy paraffinic distillate	64742-54-7	88.0 ~ 97.0
2) Calcium branched chain alkyl phenate sulfide		Commercial Secret	0.5 ~ 1.5
3) Polyolefin polyamine succinimide, polyol		Commercial Secret	0.5 ~ 1.0
4) Additive mixture (S1)		Commercial Secret	3.0 ~ 8.0
5) Olefin copolymer		9010-79-1	0.5 ~ 1.0

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) Recommanded(or prohibited) extinguishing media
○ Recommanded 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 Stroage

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) Stroage :
Stroage in closed containers.
Stroage 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 : No data
○ OSHA : No data
○ NIOSH : No data
○ AHIA : No data
○ Biological exposure limits : No data

2) Calcium branched chain alkyl phenate sulfide
○ ACGIH : No data
○ Biological exposure limits : No data

3) Polyolefin polyamine succinimide, polyol
○ ACGIH : No data
○ Biological exposure limits : No data

4) Additive mixture (S1)
○ ACGIH : No data
○ Biological exposure limits : No data

5) Olefin 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 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 based on published literature or manufacturer data.

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℃

7) Flash point : 219℃ (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℃

12) Solubility : No data

13) Vapor density : 5 mmHg

14) Relative density : 0.855

15) Partition coeficient: n-octano/water : No data

16) Auto-ignition temperature : No data

17) Decomposition temperature : No data

18) Viscosity : 10.3cSt(100℃)

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 effectsfrom short or long term exposure

1) Distillates, Hydrotreated Heavy Paraffinic
○ Acute Toxicity
- Oral : Not determined / LD 50 > 5000 mg/kg bw : rat
- Dermal : Not determined / LD 50 > 5000 mg/kg bw : rabbit
- Inhalation : category 4 / LC 50 = 2.18 mg/l (4hr) : rat
○ Skin Corrosion / irritation : No irritating (Rabbit)
○ Severe eye Damage/irritation : no irritating (rabbit)
○ Respiratory sensitization : Not determined
○ Skin sensitization : Not determined
○ Carcinogenity : MOL, OSHA, IARC : No data
○ Germ cell mutagenity : Negative (Ames test)
○ ReproductiveToxicity : No data
○ Specific target organToxicity(single exposure) : No data
○ Specific target organToxicity(repeated exposure) : No data
○ Aspiration toxicity : No data

2) Calcium branched chain alkyl phenate sulfide
○ Acute Toxicity
- Oral : No data
- Dermal : No data
- Inhalation : No data
○ Skin Corrosion / irritation : No data
○ Severe eye Damage / irritation : No data
○ Respiratory sensitization : No data

○ Skin sensitization : No data
○ Carcinogenity : No data
○ Germ cell mutagenity : No data
○ ReproductiveToxicity : No data
○ Specific target organToxicity(single exposure) : No data
○ Specific target organToxicity(repeated exposure) : No data
○ Aspiration toxicity : No data

3) Polyolefin polyamine succinimide, polyol
○ Acute Toxicity
- Oral : No data
- Dermal : No data
- Inhalation : No data
○ Skin Corrosion / irritation : No data
○ Severe eye Damage / irritation : No data
○ Respiratory sensitization : No data
○ Skin sensitization : No data
○ Carcinogenity : No data
○ Germ cell mutagenity : No data
○ ReproductiveToxicity : No data
○ Specific target organToxicity(single exposure) : No data
○ Specific target organToxicity(repeated exposure) : No data
○ Aspiration toxicity : No data

4) Additive mixture (S1)
○ Acute Toxicity
- Oral : No data
- Dermal : No data
- Inhalation : No data
○ Skin Corrosion / irritation : No data
○ Severe eye Damage / irritation : No data
○ Respiratory sensitization : No data
○ Skin sensitization : No data
○ Carcinogenity : No data
○ Germ cell mutagenity : No data
○ ReproductiveToxicity : No data
○ Specific target organToxicity(single exposure) : No data
○ Specific target organToxicity(repeated exposure) : No data
○ Aspiration toxicity : No data

5) Olefin copolymer
○ Acute Toxicity
- Oral : LD50 in rats is > 5000 mg/Kg
- Dermal : LD50 in rabbits is > 2000 mg/Kg
- Inhalation : No data
○ Skin Corrosion / irritation : No data
○ Severe eye Damage / irritation : No data
○ Respiratory sensitization : No data
○ Skin sensitization : No data
○ Carcinogenity : No data
○ Germ cell mutagenity : No data
○ ReproductiveToxicity : No data

○ Specific target organToxicity(single exposure) : No data
○ Specific target organToxicity(repeated exposure) : No data
○ Aspiration toxicity : No data

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

12. Ecological Information

A. Aquatic, terrestrial organisms toxicity :
1) Distillates, Hydrotreated Heavy Paraffinic
- No data
2) Calcium branched chain alkyl phenate sulfide
- No data
3) Polyolefin polyamine succinimide, polyol
- No data
4) Additive mixture (S1)
- No data
5) Olefin copolymer
- The acute LC50 is > 1000 mg/L based on actual data.(fish)

B. Persistence and degradability :
1) Distillates, Hydrotreated Heavy Paraffinic
- No data
2) Calcium branched chain alkyl phenate sulfide
- No data
3) Polyolefin polyamine succinimide, polyol
- No data
4) Additive mixture (S1)
- No data
5) Olefin copolymer
- Shows limited biodegradation based on actual OECD 301-type test data
- Shows limited biodegradation based on actual OECD 302-type test data

C. Bioaccumulative potential
1) Distillates, Hydrotreated Heavy Paraffinic
- Contains components with the potential to bioaccumulate.
2) Calcium branched chain alkyl phenate sulfide
- No data
3) Polyolefin polyamine succinimide, polyol
- No data
4) Additive mixture (S1)
- No data
5) Olefin copolymer
- No data

D. Mobility in soil :
1.Distillates, Hydrotreated Heavy Paraffinic
- Expected to have mobility in soils.
2) Calcium branched chain alkyl phenate sulfide
- No data
3) Polyolefin polyamine succinimide, polyol
- No data

4) Additive mixture (S1)
- No data
5) Olefin 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

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
- Calcium branched chain alkyl phenate sulfide: No data
- Polyolefin polyamine succinimide, polyol: No data
- Additive mixture (S1): No data
- Olefin copolymer: 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
- Calcium branched chain alkyl phenate sulfide: No data
- Polyolefin polyamine succinimide, polyol: No data

- Additive mixture (S1): No data
- Olefin copolyme: No data

E. Other internal and foreign acts

1) Distillates, Hydrotreated Heavy Paraffinic

○ EU classification

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

○ U.S. acts

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

2) Calcium branched chain alkyl phenate sulfide

○ EU classification

- No data

○ U.S. acts

- No data

3) Polyolefin polyamine succinimide, polyol

○ EU classification

- No data

○ U.S. acts

- No data

4) 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

5) Olefin 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

16. Other Information

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

2) Date of preparation of the first version of the MSDS : 2012.11.30

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

4) Others :

To the best of our knowledge, the information provided in this MSDS document is correct. Access to this information is being provided via the Internet so that it can be made available to as many potential users as possible. We do not assume any liability for consequences of the use of this information since it may be applied under conditions beyond our control or knowledge. Also, it is possible that additional data could be made available after this MSDS was issued.
Certain hazards are described herein, however these may not be the only hazards that exist. All materials may present unknown hazards and should be used with caution.
Customers are encouraged to review this information, follow precautions, and comply with all applicable laws and regulations regarding the use and disposal of this product.
For specific technical data or advice concerning this product as supplied in your country please contact your local sales representative.
The final determination of the suitability of any material is the sole responsibility of the user.

Material Safety Data Sheet
(MSDS)

Product	Kixx HD CF-4 10W-30

Team	Date of first preparation	Date of last revision	Revision Number
Finished Lubricants R&D Team	2012-11-30	2017-10-26	3

1. Chemical Product and Company Information

1) Product : Kixx HD CF-4 10W-30

2) Recommended use of the chemical and restrictions on use
- ○ Recommended use : Internal combustion 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

3. Composition and Information on Ingredients

Component	Synonyms	CAS No.	Content(%)
1) Distillates, Hydrotreated Heavy Paraffinic	Hydrotreated (severe) heavy paraffinic distillate	64742-54-7	80 ~ 90
2) Additive for Diesel Engine Oil(S1)		Commercial Secret	6 ~ 10
3) Viscosity Modifier Mixture(S2)		Commercial Secret	3 ~ 8
4) Pour Point Depressant Mixture(S3)		Commercial Secret	0.1 ~ 1

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) Recommanded(or prohibited) extinguishing media
   ○ Recommanded 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 Stroage

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) Stroage :
Stroage in closed containers.
Stroage 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 : No data
○ OSHA : No data
○ NIOSH : No data
○ AHIA : No data
○ Biological exposure limits : No data

2) Calcium branched chain alkyl phenate sulfide

○ ACGIH : No data
○ Biological exposure limits : No data

3) Polyolefin polyamine succinimide, polyol
○ ACGIH : No data
○ Biological exposure limits : No data

4) Additive mixture (S1)
○ ACGIH : No data
○ Biological exposure limits : No data

5) Olefin 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 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 based on published literature or manufacturer data.

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℃

7) Flash point : 220℃ (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℃

12) Solubility : No data

13) Vapor density : 5 mmHg

14) Relative density : 0.872

15) Partition coeficient: n-octano/water : No data

16) Auto-ignition temperature : No data

17) Decomposition temperature : No data

18) Viscosity : 9.75cSt(100℃)

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 effectsfrom short or long term exposure

1) Distillates, Hydrotreated Heavy Paraffinic

○ Acute Toxicity
- Oral : Not determined / LD 50 > 5000 mg/kg bw : rat
- Dermal : Not determined / LD 50 > 5000 mg/kg bw : rabbit
- Inhalation : category 4 / LC 50 = 2.18 mg/l (4hr) : rat

○ Skin Corrosion / irritation : No irritating (Rabbit)
○ Severe eye Damage/irritation : no irritating (rabbit)
○ Respiratory sensitization : Not determined
○ Skin sensitization : Not determined
○ Carcinogenity : MOL, OSHA, IARC : No data
○ Germ cell mutagenity : Negative (Ames test)
○ ReproductiveToxicity : No data
○ Specific target organToxicity(single exposure) : No data
○ Specific target organToxicity(repeated exposure) : No data
○ Aspiration toxicity : No data

2) Calcium branched chain alkyl phenate sulfide
○ Acute Toxicity
- Oral : No data
- Dermal : No data
- Inhalation : No data

○ Skin Corrosion / irritation : No data
○ Severe eye Damage / irritation : No data
○ Respiratory sensitization : No data
○ Skin sensitization : No data
○ Carcinogenity : No data
○ Germ cell mutagenity : No data
○ ReproductiveToxicity : No data
○ Specific target organToxicity(single exposure) : No data
○ Specific target organToxicity(repeated exposure) : No data
○ Aspiration toxicity : No data

3) Polyolefin polyamine succinimide, polyol
○ Acute Toxicity
- Oral : No data
- Dermal : No data
- Inhalation : No data

○ Skin Corrosion / irritation : No data
○ Severe eye Damage / irritation : No data
○ Respiratory sensitization : No data
○ Skin sensitization : No data
○ Carcinogenity : No data
○ Germ cell mutagenity : No data
○ ReproductiveToxicity : No data
○ Specific target organToxicity(single exposure) : No data
○ Specific target organToxicity(repeated exposure) : No data
○ Aspiration toxicity : No data

4) Additive mixture (S1)
○ Acute Toxicity
- Oral : No data
- Dermal : No data
- Inhalation : No data

○ Skin Corrosion / irritation : No data

○ Severe eye Damage / irritation : No data
○ Respiratory sensitization : No data
○ Skin sensitization : No data
○ Carcinogenity : No data
○ Germ cell mutagenity : No data
○ ReproductiveToxicity : No data
○ Specific target organToxicity(single exposure) : No data
○ Specific target organToxicity(repeated exposure) : No data
○ Aspiration toxicity : No data

5) Olefin copolymer
○ Acute Toxicity
- Oral : LD50 in rats is > 5000 mg/Kg
- Dermal : LD50 in rabbits is > 2000 mg/Kg
- Inhalation : No data
○ Skin Corrosion / irritation : No data
○ Severe eye Damage / irritation : No data
○ Respiratory sensitization : No data
○ Skin sensitization : No data
○ Carcinogenity : No data
○ Germ cell mutagenity : No data
○ ReproductiveToxicity : No data
○ Specific target organToxicity(single exposure) : No data
○ Specific target organToxicity(repeated exposure) : No data
○ Aspiration toxicity : No data

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

12. Ecological Information

A. Aquatic, terrestrial organisms toxicity :
1) Distillates, Hydrotreated Heavy Paraffinic
- No data
2) Calcium branched chain alkyl phenate sulfide
- No data
3) Polyolefin polyamine succinimide, polyol
- No data
4) Additive mixture (S1)
- No data
5) Olefin copolymer
- The acute LC50 is > 1000 mg/L based on actual data.(fish)

B. Persistence and degradability :
1) Distillates, Hydrotreated Heavy Paraffinic
- No data
2) Calcium branched chain alkyl phenate sulfide
- No data
3) Polyolefin polyamine succinimide, polyol
- No data
4) Additive mixture (S1)
- No data
5) Olefin copolymer
- Shows limited biodegradation based on actual OECD 301-type test data

- Shows limited biodegradation based on actual OECD 302-type test data

C. Bioaccumulative potential

1) Distillates, Hydrotreated Heavy Paraffinic
   - Contains components with the potential to bioaccumulate.
2) Calcium branched chain alkyl phenate sulfide
   - No data
3) Polyolefin polyamine succinimide, polyol
   - No data
4) Additive mixture (S1)
   - No data
5) Olefin copolymer
   - No data

D. Mobility in soil :

1.Distillates, Hydrotreated Heavy Paraffinic
   - Expected to have mobility in soils.
2) Calcium branched chain alkyl phenate sulfide
   - No data
3) Polyolefin polyamine succinimide, polyol
   - No data
4) Additive mixture (S1)
   - No data
5) Olefin 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

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
- Calcium branched chain alkyl phenate sulfide: No data
- Polyolefin polyamine succinimide, polyol: No data
- Additive mixture (S1): No data
- Olefin copolymer: 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
- Calcium branched chain alkyl phenate sulfide: No data
- Polyolefin polyamine succinimide, polyol: No data
- Additive mixture (S1): No data
- Olefin copolyme: No data

E. Other internal and foreign acts

1) Distillates, Hydrotreated Heavy Paraffinic

○ EU classification

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

○ U.S. acts

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

2) Calcium branched chain alkyl phenate sulfide

○ EU classification

- No data

○ U.S. acts

- No data

3) Polyolefin polyamine succinimide, polyol

○ EU classification

- No data

○ U.S. acts

- No data

4) 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

5) Olefin 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

16. Other Information

1) References

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

2) Date of preparation of the first version of the MSDS : 2012.11.30

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

4) Others :

To the best of our knowledge, the information provided in this MSDS document is correct. Access to this information is being provided via the Internet so that it can be made available to as many potential users as possible. We do not assume any liability for consequences of the use of this information since it may be applied under conditions beyond our control or knowledge. Also, it is possible that additional data could be made available after this MSDS was issued.
Certain hazards are described herein, however these may not be the only hazards that exist. All materials may present unknown hazards and should be used with caution.
Customers are encouraged to review this information, follow precautions, and comply with all applicable laws and regulations regarding the use and disposal of this product.
For specific technical data or advice concerning this product as supplied in your country please contact your local sales representative.
The final determination of the suitability of any material is the sole responsibility of the user.

Material Safety Data Sheet
(MSDS)

Product	Kixx HD CF-4 15W-40

Team	Date of first preparation	Date of last revision	Revision Number
Finished Lubricants R&D Team	2012-11-30	2017-10-26	3

1. Chemical Product and Company Information

1) Product :Kixx HD CF-4 15W-40

2) Recommended use of the chemical and restrictions on use
- ○ Recommended use : Internal combustion 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

3. Composition and Information on Ingredients

Component	Synonyms	CAS No.	Content(%)
1) Distillates, Hydrotreated Heavy Paraffinic	Hydrotreated (severe) heavy paraffinic distillate	64742-54-7	80.0 ~ 90.0
2) Additive for Diesel Engine Oil (S1)		Commercial Secret	3.0 ~ 8.0
3) Viscosity Modifier Mixture (S2)		Commercial Secret	5.0 ~ 10.0

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) Recommanded(or prohibited) extinguishing media
   ○ Recommanded 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 Stroage

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) Stroage :
Stroage in closed containers.
Stroage 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 : No data
- ○ OSHA : No data
- ○ NIOSH : No data
- ○ AHIA : No data
- ○ Biological exposure limits : No data

2) Additive for Diesel Engine Oil (S1)
- ○ ACGIH : No data
- ○ Biological exposure limits : No data

3) Viscosity Modifier Mixture (S2)
- ○ 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 based on published literature or manufacturer data.

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℃

7) Flash point : 240℃ (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℃

12) Solubility : No data

13) Vapor density : 5 mmHg

14) Relative density : 0.87

15) Partition coeficient: n-octano/water : No data

16) Auto-ignition temperature : No data

17) Decomposition temperature : No data

18) Viscosity : 14.9cSt(100℃)

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 effectsfrom short or long term exposure

1) Distillates, Hydrotreated Heavy Paraffinic
○ Acute Toxicity
- Oral : Not determined / LD 50 > 5000 mg/kg bw : rat
- Dermal : Not determined / LD 50 > 5000 mg/kg bw : rabbit
- Inhalation : category 4 / LC 50 = 2.18 mg/l (4hr) : rat
○ Skin Corrosion / irritation : No irritating (Rabbit)
○ Severe eye Damage/irritation : no irritating (rabbit)
○ Respiratory sensitization : Not determined
○ Skin sensitization : Not determined
○ Carcinogenity : MOL, OSHA, IARC : No data
○ Germ cell mutagenity : Negative (Ames test)
○ ReproductiveToxicity : No data
○ Specific target organToxicity(single exposure) : No data
○ Specific target organToxicity(repeated exposure) : No data
○ Aspiration toxicity : No data

2) Additive for Diesel Engine Oil (S1)
○ Acute Toxicity
- Oral : No data
- Dermal : No data
- Inhalation : No data
○ Skin Corrosion / irritation : No data
○ Severe eye Damage / irritation : No data
○ Respiratory sensitization : No data
○ Skin sensitization : No data
○ Carcinogenity : No data
○ Germ cell mutagenity : No data
○ ReproductiveToxicity : No data
○ Specific target organToxicity(single exposure) : No data
○ Specific target organToxicity(repeated exposure) : No data
○ Aspiration toxicity : No data

3) Viscosity Modifier Mixture (S2)
○ Acute Toxicity

- Oral : LD50 in rats is > 5000 mg/Kg
- Dermal : LD50 in rabbits is > 2000 mg/Kg
- Inhalation : No data

○ Skin Corrosion / irritation : No data
○ Severe eye Damage / irritation : No data
○ Respiratory sensitization : No data
○ Skin sensitization : No data
○ Carcinogenity : No data
○ Germ cell mutagenity : No data
○ ReproductiveToxicity : No data
○ Specific target organToxicity(single exposure) : No data
○ Specific target organToxicity(repeated exposure) : No data
○ Aspiration toxicity : No data

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

12. Ecological Information

A. Aquatic, terrestrial organisms toxicity :
1) Distillates, Hydrotreated Heavy Paraffinic
- No data
2) Additive for Diesel Engine Oil (S1)
- No data
3) Viscosity Modifier Mixture (S2)
- The acute LC50 is > 1000 mg/L based on actual data.(fish)

B. Persistence and degradability :
1) Distillates, Hydrotreated Heavy Paraffinic
- No data
2) Additive for Diesel Engine Oil (S1)
- No data
3) Viscosity Modifier Mixture (S2)
- Shows limited biodegradation based on actual OECD 301-type test data
- Shows limited biodegradation based on actual OECD 302-type test data

C. Bioaccumulative potential
1) Distillates, Hydrotreated Heavy Paraffinic
- Contains components with the potential to bioaccumulate.
2) Additive for Diesel Engine Oil (S1)
- No data
3) Viscosity Modifier Mixture (S2)
- No data

D. Mobility in soil :
1) Distillates, Hydrotreated Heavy Paraffinic
- Expected to have mobility in soils.
2) Additive for Diesel Engine Oil (S1)
- No data

3) Viscosity Modifier Mixture (S2)
- 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)
Not determined

B. Chemical control act (Korea)
Not determined

C. Dangerous Goods Safe Control Act (Korea)
Category 4 Dangerous Goods (Flammable Liquids), Grade 4 petroleum chemicals

D. Wastes control act (Korea)
No data

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

2) Date of preparation of the first version of the MSDS : 2012.11.30

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

4) Others :

To the best of our knowledge, the information provided in this MSDS document is correct. Access to this information is being provided via the Internet so that it can be made available to as many potential users as possible. We do not assume any liability for consequences of the use of this information since it may be applied under conditions beyond our control or knowledge. Also, it is possible that additional data could be made available after this MSDS was issued.
Certain hazards are described herein, however these may not be the only hazards that exist. All materials may present unknown hazards and should be used with caution.
Customers are encouraged to review this information, follow precautions, and comply with all applicable laws and regulations regarding the use and disposal of this product.
For specific technical data or advice concerning this product as supplied in your country please contact your local sales representative.
The final determination of the suitability of any material is the sole responsibility of the user.

Material Safety Data Sheet
(MSDS)

Product	Kixx HD CF-4 15W-50

Team	Date of first preparation	Date of last revision	Revision Number
Finished Lubricants R&D Team	2012-11-30	2017-10-26	3

1. Chemical Product and Company Information

1) Product : Kixx HD CF-4 15W-50

2) Recommended use of the chemical and restrictions on use
- ○ Recommended use : Internal combustion 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

3. Composition and Information on Ingredients

Component	Synonyms	CAS No.	Content(%)
1) Distillates, Hydrotreated Heavy Paraffinic	Hydrotreated (severe) heavy paraffinic distillate	64742-54-7	75 ~ 85
2) Additive for Diesel Engine Oil(S1)		Commercial Secret	6 ~ 10
3) Viscosity Modifier Mixture(S2)		Commercial Secret	8 ~ 15
4) Pour Point Depressant Mixture(S3)		Commercial Secret	0.1 ~ 1

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) Recommanded(or prohibited) extinguishing media
   ○ Recommanded 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 Stroage

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) Stroage :
Stroage in closed containers.
Stroage 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 : No data
○ OSHA : No data
○ NIOSH : No data
○ AHIA : No data
○ Biological exposure limits : No data

2) Additive for Diesel Engine Oil(S1)

○ ACGIH : No data
○ Biological exposure limits : No data

3) Viscosity Modifier Mixture(S2)
○ ACGIH : No data
○ Biological exposure limits : No data

4) Pour Point Depressant Mixture(S3)
○ 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 based on published literature or manufacturer data.

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℃

7) Flash point : 220℃ (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℃

12) Solubility : No data

13) Vapor density : 5 mmHg

14) Relative density : 0.872

15) Partition coeficient: n-octano/water : No data

16) Auto-ignition temperature : No data

17) Decomposition temperature : No data

18) Viscosity : 9.75cSt(100℃)

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 effectsfrom short or long term exposure

1) Distillates, Hydrotreated Heavy Paraffinic
○ Acute Toxicity
   - Oral : Not determined / LD 50 > 5000 mg/kg bw : rat
   - Dermal : Not determined / LD 50 > 5000 mg/kg bw : rabbit
   - Inhalation : category 4 / LC 50 = 2.18 mg/l (4hr) : rat

○ Skin Corrosion / irritation : No irritating (Rabbit)
○ Severe eye Damage/irritation : no irritating (rabbit)
○ Respiratory sensitization : Not determined
○ Skin sensitization : Not determined
○ Carcinogenity : MOL, OSHA, IARC : No data
○ Germ cell mutagenity : Negative (Ames test)
○ ReproductiveToxicity : No data
○ Specific target organToxicity(single exposure) : No data
○ Specific target organToxicity(repeated exposure) : No data
○ Aspiration toxicity : No data

2) Additive for Diesel Engine Oil(S1)
○ Acute Toxicity
- Oral : No data
- Dermal : No data
- Inhalation : No data
○ Skin Corrosion / irritation : No data
○ Severe eye Damage / irritation : No data
○ Respiratory sensitization : No data
○ Skin sensitization : No data
○ Carcinogenity : No data
○ Germ cell mutagenity : No data
○ ReproductiveToxicity : No data
○ Specific target organToxicity(single exposure) : No data
○ Specific target organToxicity(repeated exposure) : No data
○ Aspiration toxicity : No data

3) Viscosity Modifier Mixture(S2)
○ Acute Toxicity
- Oral : LD50 in rats is > 5000 mg/Kg
- Dermal : LD50 in rabbits is > 2000 mg/Kg
- Inhalation : No data
○ Skin Corrosion / irritation : No data
○ Severe eye Damage / irritation : No data
○ Respiratory sensitization : No data
○ Skin sensitization : No data
○ Carcinogenity : No data
○ Germ cell mutagenity : No data
○ ReproductiveToxicity : No data
○ Specific target organToxicity(single exposure) : No data
○ Specific target organToxicity(repeated exposure) : No data
○ Aspiration toxicity : No data

4) Pour Point Depressant Mixture(S3)
○ Acute Toxicity
- Oral : LD50 rat, (analogy) > 2,000 mg/kg
- Dermal : LD50 rat, (analogy) > 2,000 mg/kg
- Inhalation : No data
○ Skin Corrosion / irritation : No data
○ Severe eye Damage / irritation : No data
○ Respiratory sensitization : No data
○ Skin sensitization : No data
○ Carcinogenity : No data

○ Germ cell mutagenity : No data
○ ReproductiveToxicity : No data
○ Specific target organToxicity(single exposure) : No data
○ Specific target organToxicity(repeated exposure) : No data
○ Aspiration toxicity : No data

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

12. Ecological Information

A. Aquatic, terrestrial organisms toxicity :
1) Distillates, Hydrotreated Heavy Paraffinic
- No data
2) Additive for Diesel Engine Oil(S1)
- No data
3) Viscosity Modifier Mixture(S2)
- The acute LC50 is > 1000 mg/L based on actual data.(fish)
4) Pour Point Depressant Mixture(S3)
- No data

B. Persistence and degradability :
1) Distillates, Hydrotreated Heavy Paraffinic
- No data
2) Additive for Diesel Engine Oil(S1)
- No data
3) Viscosity Modifier Mixture(S2)
- Shows limited biodegradation based on actual OECD 301-type test data
- Shows limited biodegradation based on actual OECD 302-type test data
4) Pour Point Depressant Mixture(S3)
- No data

C. Bioaccumulative potential
1) Distillates, Hydrotreated Heavy Paraffinic
- Contains components with the potential to bioaccumulate.
2) Additive for Diesel Engine Oil (S1)
- No data
3) Viscosity Modifier Mixture (S2)
- No data
4) Pour Point Depressant Mixture(S3)
- No data

D. Mobility in soil :
1) Distillates, Hydrotreated Heavy Paraffinic
- Expected to have mobility in soils.
2) Additive for Diesel Engine Oil (S1)
- No data
3) Viscosity Modifier Mixture (S2)
- No data
4) Pour Point Depressant Mixture(S3)
- 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)
Not determined

B. Chemical control act (Korea)
Not determined

C. Dangerous Goods Safe Control Act (Korea)
Category 4 Dangerous Goods (Flammable Liquids), Grade 4 petroleum chemicals

D. Wastes control act (Korea)
No data

E. Other internal and foreign acts
○ EU classification : 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 Occupatonal Safety & Health Agency
- GS Caltex R&D Center

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

2) Date of preparation of the first version of the MSDS : 2012.11.30

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

4) Others :

To the best of our knowledge, the information provided in this MSDS document is correct. Access to this information is being provided via the Internet so that it can be made available to as many potential users as possible. We do not assume any liability for consequences of the use of this information since it may be applied under conditions beyond our control or knowledge. Also, it is possible that additional data could be made available after this MSDS was issued.
Certain hazards are described herein, however these may not be the only hazards that exist. All materials may present unknown hazards and should be used with caution.
Customers are encouraged to review this information, follow precautions, and comply with all applicable laws and regulations regarding the use and disposal of this product.
For specific technical data or advice concerning this product as supplied in your country please contact your local sales representative.
The final determination of the suitability of any material is the sole responsibility of the user.

Material Safety Data Sheet
(MSDS)

Product	Kixx HD CF-4 20W-50

Team	Date of first preparation	Date of last revision	Revision Number
Finished Lubricants R&D Team	2012-11-30	2017-10-26	3

1. Chemical Product and Company Information

1) Product : Kixx HD CF-4 20W-50

2) Recommended use of the chemical and restrictions on use
- ○ Recommended use : Internal combustion 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
- Distillates, Hydrotreated Heavy Paraffinic	0	1	0
- Zinc alkyldithiophosphate	1	1	0
- Additive mixture (S1)	1	1	0
- Olefin copolymer	0	1	0

3. Composition and Information on Ingredients

Component	Synonyms	CAS No.	Content(%)
1) Distillates, Hydrotreated Heavy Paraffinic	Hydrotreated (severe) heavy paraffinic distillate	64742-54-7	80.0 ~ 90.0
2) Zinc alkyldithiophosphate	Phosphorodithioic acid	68649-42-3	0.5 ~ 1.5
3) Additive mixture (S1)	Not Applicable	Not Determined	5.0 ~ 10.0
4) Olefin copolymer	OCP	9010-79-1	5.0 ~ 10.0

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) Recommanded(or prohibited) extinguishing media
○ Recommanded 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 Stroage

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) Stroage :
Stroage in closed containers.
Stroage 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 : No data
○ OSHA : No data
○ NIOSH : No data
○ AHIA : No data
○ Biological exposure limits : No data

2) Calcium branched chain alkyl phenate sulfide
○ ACGIH : No data
○ Biological exposure limits : No data

3) Polyolefin polyamine succinimide, polyol
○ ACGIH : No data
○ Biological exposure limits : No data

4) Additive mixture (S1)
○ ACGIH : No data
○ Biological exposure limits : No data

5) Olefin 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 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 based on published literature or manufacturer data.

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℃

7) Flash point : 220℃ (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℃

12) Solubility : No data

13) Vapor density : 5 mmHg

14) Relative density : 0.872

15) Partition coeficient: n-octano/water : No data

16) Auto-ignition temperature : No data

17) Decomposition temperature : No data

18) Viscosity : 19.63cSt(100℃)

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 effectsfrom short or long term exposure

1) Distillates, Hydrotreated Heavy Paraffinic
○ Acute Toxicity
- Oral : Not determined / LD 50 > 5000 mg/kg bw : rat
- Dermal : Not determined / LD 50 > 5000 mg/kg bw : rabbit
- Inhalation : category 4 / LC 50 = 2.18 mg/l (4hr) : rat

○ Skin Corrosion / irritation : No irritating (Rabbit)
○ Severe eye Damage/irritation : no irritating (rabbit)
○ Respiratory sensitization : Not determined
○ Skin sensitization : Not determined
○ Carcinogenity : MOL, OSHA, IARC : No data
○ Germ cell mutagenity : Negative (Ames test)
○ ReproductiveToxicity : No data
○ Specific target organToxicity(single exposure) : No data
○ Specific target organToxicity(repeated exposure) : No data
○ Aspiration toxicity : No data

2) Calcium branched chain alkyl phenate sulfide
○ Acute Toxicity
- Oral : No data
- Dermal : No data
- Inhalation : No data

○ Skin Corrosion / irritation : No data
○ Severe eye Damage / irritation : No data

○ Respiratory sensitization : No data
○ Skin sensitization : No data
○ Carcinogenity : No data
○ Germ cell mutagenity : No data
○ ReproductiveToxicity : No data
○ Specific target organToxicity(single exposure) : No data
○ Specific target organToxicity(repeated exposure) : No data
○ Aspiration toxicity : No data

3) Polyolefin polyamine succinimide, polyol
○ Acute Toxicity
- Oral : No data
- Dermal : No data
- Inhalation : No data
○ Skin Corrosion / irritation : No data
○ Severe eye Damage / irritation : No data
○ Respiratory sensitization : No data
○ Skin sensitization : No data
○ Carcinogenity : No data
○ Germ cell mutagenity : No data
○ ReproductiveToxicity : No data
○ Specific target organToxicity(single exposure) : No data
○ Specific target organToxicity(repeated exposure) : No data
○ Aspiration toxicity : No data

4) Additive mixture (S1)
○ Acute Toxicity
- Oral : No data
- Dermal : No data
- Inhalation : No data
○ Skin Corrosion / irritation : No data
○ Severe eye Damage / irritation : No data
○ Respiratory sensitization : No data
○ Skin sensitization : No data
○ Carcinogenity : No data
○ Germ cell mutagenity : No data
○ ReproductiveToxicity : No data
○ Specific target organToxicity(single exposure) : No data
○ Specific target organToxicity(repeated exposure) : No data
○ Aspiration toxicity : No data

5) Olefin copolymer
○ Acute Toxicity
- Oral : LD50 in rats is > 5000 mg/Kg
- Dermal : LD50 in rabbits is > 2000 mg/Kg
- Inhalation : No data
○ Skin Corrosion / irritation : No data
○ Severe eye Damage / irritation : No data
○ Respiratory sensitization : No data
○ Skin sensitization : No data
○ Carcinogenity : No data

○ Germ cell mutagenity : No data
○ ReproductiveToxicity : No data
○ Specific target organToxicity(single exposure) : No data
○ Specific target organToxicity(repeated exposure) : No data
○ Aspiration toxicity : No data

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

12. Ecological Information

A. Aquatic, terrestrial organisms toxicity :
1) Distillates, Hydrotreated Heavy Paraffinic
- No data
2) Calcium branched chain alkyl phenate sulfide
- No data
3) Polyolefin polyamine succinimide, polyol
- No data
4) Additive mixture (S1)
- No data
5) Olefin copolymer
- The acute LC50 is > 1000 mg/L based on actual data.(fish)

B. Persistence and degradability :
1) Distillates, Hydrotreated Heavy Paraffinic
- No data
2) Calcium branched chain alkyl phenate sulfide
- No data
3) Polyolefin polyamine succinimide, polyol
- No data
4) Additive mixture (S1)
- No data
5) Olefin copolymer
- Shows limited biodegradation based on actual OECD 301-type test data
- Shows limited biodegradation based on actual OECD 302-type test data

C. Bioaccumulative potential
1) Distillates, Hydrotreated Heavy Paraffinic
- Contains components with the potential to bioaccumulate.
2) Calcium branched chain alkyl phenate sulfide
- No data
3) Polyolefin polyamine succinimide, polyol
- No data
4) Additive mixture (S1)
- No data
5) Olefin copolymer
- No data

D. Mobility in soil :
1.Distillates, Hydrotreated Heavy Paraffinic
- Expected to have mobility in soils.
2) Calcium branched chain alkyl phenate sulfide

- No data

3) Polyolefin polyamine succinimide, polyol
- No data

4) Additive mixture (S1)
- No data

5) Olefin 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

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
- Calcium branched chain alkyl phenate sulfide: No data
- Polyolefin polyamine succinimide, polyol: No data
- Additive mixture (S1): No data
- Olefin copolymer: 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
- Calcium branched chain alkyl phenate sulfide: No data
- Polyolefin polyamine succinimide, polyol: No data
- Additive mixture (S1): No data
- Olefin copolyme: No data

E. Other internal and foreign acts

1) Distillates, Hydrotreated Heavy Paraffinic

○ EU classification

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

○ U.S. acts

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

2) Calcium branched chain alkyl phenate sulfide

○ EU classification

- No data

○ U.S. acts

- No data

3) Polyolefin polyamine succinimide, polyol

○ EU classification

- No data

○ U.S. acts

- No data

4) Additive mixture (S1)

○ EU classification

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

○ U.S. acts

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

5) Olefin 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
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- EPCRA 313 (40CFR372.65) : Not determined

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- 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 : 2012.11.30

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

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