

GS 칼텍스 Material Safety Data Sheet (MSDS)

Product	Kixx G1 SN 5W-20

Team	Date of first preparation	Date of last revision	Revision Number
Finished Lubricants	2012-11-30	2017-10-26	2
R&D Team	2012-11-30	2017-10-20	J

1. Chemical Product and Company Information

1) Product: Kixx G1 SN 5W-20

- 2) Recommended use of the chemical and restrictions on use
 - O Recommended use: Lubricants, Gasoline Engine Oil
 - O Restrictions on use:
- 3) Manufacture/Supplier information
 - Supply company : GS Caltex Corporation
 - O Address: Nonhyeon-ro 508(Yeoksam-dong), Gangnam-gu, Seoul, South Korea
 - Information service or emergency call : 82-2-1899-5145
 - O 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
 - O Symbol: No symbol
 - O 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

NFPA Component	Health	Fire	Reactivity
1. Distillates, Hydrotreated Heavy Paraffinic	1	1	0
2. Zinc Alkyl Dithiophosphate	1	1	0
3. Alkenoic Acid Ester, Borated	1	1	0

4. Additive mixture (S1)	1	1	0	
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3. Composition and Information on Ingredients

Component	Synonyms	CAS No.	Content(%)
1. Distillates, Hydrotreated Heavy	Hydrotreated (severe)	64742-54-7	80 ~ 90
Paraffinic	heavy paraffinic distillate	017 12 31 7	00 30
2. Zinc Alkyl Dithiophosphate	Phosphorodithioic acid	68649-42-3	< 1
3. Alkenoic Acid Ester, Borated	Polyhydroxy Ester Borated	Not Determined	< 1
4. Additive mixture (S1)	Not Applicable	Not Determined	5 ~ 15

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

- High pressure water shoot
- Large fire :
- fire fighting foam or water spray
- 2) Specific hazard from chemical material
 - O Toxicant from combustion : Carbon oxides
 - O 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
 - O 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 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) 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

 Distillates, Hydrotreated Heavy Paraf

 \bigcirc ACGIH : TWA : 5mg/m3

STEL: 10mg/m3

○ NIOSH: TWA: 5mg/m3

STEL: 10mg/m3

O Biological exposure limits: No data

2) Zinc Alkyl Dithiophosphate

- ACGIH: No data
- O Biological exposure limits: No data
- 3) Alkenoic Acid Ester, Borated
 - ACGIH : No data
 - O Biological exposure limits: No data
- 4) Additive mixture (S1)
 - ACGIH: No data
 - O 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:

O 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

O 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.

O Hands protection :

Use proper chemical resistant gloves.

O 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: 0.8520 Kg/L @ 15℃

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

16) Auto-ignition temperature :> 260°C

17) Decomposition temperature: No data

18) Viscosity: 8.3 cSt @ 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 :
 - 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.
- O Skin contact : May cause slight skin irritation.
- O 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 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
 Zinc Alkyl 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) Alkenoic Acid Ester, Borated ○ 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) Additive mixture (S1) O Acute oral toxicity Oral: No data

- Dermal : No data - Inhalation : No data

 Serious eye damage/e Respiratory sensitizati Skin sensitization : No Carcinogenicity : MOI Germ cell mutagenici Reproductive toxicity Specific target organ Aspiration hazard : No 	ty: Negative (Ames test) : No data systemic toxicity(single exposure): No data systemic toxicity(repeated exposure): No data
12. Ecological Information	on
A Harandaya ta tha agusti	
A. Hazardous to the aquation 1) Distillates, Hydrotreate	
☐ Fish:	No data
○ Crustacea :	No data
○ Algea :	No data
2) Zinc Alkyl dithiophosp	
○ Fish :	No data
○ Crustacea :	No data
○ Algea :	No data
3) Alkenoic Acid Ester, Bo	
○ Fish :	No data
○ Crustacea :	No data
○ Algea :	No data
4) Additive mixture (S1)	NO data
○ Fish :	No data
○ Crustacea :	No data
	No data
○ Algea :	NO data
B. Persistence and degradal 1) Distillates, Hydrotreate	
- No data	hata
2) Zinc Alkyl dithiophosp - No data	nate
3) Alkenoic Acid Ester, Bo	prated
- No data	
4) Additive mixture (S1)	
- No data	
2) Zinc Alkyl dithiophosp	ed Heavy Paraffinic 28 day, aerotropism, domestic waste water, not disassemble)
- No data 3) Alkenoic Acid Ester, Bo	prated
- No data	rated
4) Additive mixture (S1)	
- No data	

- D. Mobility in soil:
 - 1) Distillates, Hydrotreated Heavy Paraffinic
 - No data
 - 2) Zinc Alkyl dithiophosphate
 - No data
 - 3) Alkenoic Acid Ester, Borated
 - No data
 - 4) 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
 - Zinc Alkyl dithiophosphate: No data
 - Alkenoic Acid Ester, Borated: 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
- Zinc Alkyl dithiophosphate: No data
- Alkenoic Acid Ester, Borated: 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

O 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) Zinc Alkyl dithiophosphate

EU classification

Classification: Not determinedRisk Phrases: Not determinedSafety Phrases: Not determined

O U.S. acts

- OSHA (29CFR1910.119):

- CERCLA 103 (40CFR302.4):

- EPCRA 302 (40CFR355.30):

- EPCRA 304 (40CFR355.40):

- EPCRA 313 (40CFR372.65):

Not determined

Not determined

3) Alkenoic Acid Ester, Borated

O EU classification

Classification : Not determinedRisk Phrases : Not determinedSafety 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) 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 Occupatonal 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: 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)

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

Kixx G1 SN 5W-30

1. Chemical Product and Company Information

1) Product: Kixx G1 SN 5W-30

Product

2) Recommended use of the chemical and restrictions on use

O Recommended use: Lubricants, Gasoline Engine Oil

O Restrictions on use :

3) Manufacture/Supplier information

Supply company : GS Caltex Corporation

○ Address : Nonhyeon-ro 508(Yeoksam-dong), Gangnam-gu, Seoul, South Korea

 \bigcirc Information service or emergency call : 82-2-1899-5145

O 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
 - O 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

NFPA Component	Health	Fire	Reactivity
1. Distillates, Hydrotreated Heavy Paraffinic	1	1	0
2. Zinc Alkyl Dithiophosphate	1	1	0
3. Alkenoic Acid Ester, Borated	1	1	0
4. Additive mixture (S1)	1	1	0

3. Composition and Information on Ingredients

Component	Synonyms	CAS No.	Content(%)
Distillates, Hydrotreated Heavy Paraffinic	Hydrotreated (severe) heavy paraffinic distillate	64742-54-7	76 ~ 88
2. Zinc Alkyl Dithiophosphate	Phosphorodithioic acid	68649-42-3	< 1
3. Alkenoic Acid Ester, Borated	Polyhydroxy Ester Borated	Not Determined	< 1
4. Additive mixture (S1)	Not Applicable	Not Determined	5 ~ 15

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) Recommanded(or prohibited) extinguishing media
 - O Recommanded extinguishing media:
 - Dry chemicals, CO2, water spray, fire fighting foam
 - O Prohibited extinguishing media:
 - High pressure water shoot
 - Large fire :
 - fire fighting foam or water spray
- 2) Specific hazard from chemical material
 - O Toxicant from combustion : Carbon oxides
 - O 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 Stroage

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) 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

 \bigcirc ACGIH : TWA : 5mg/m3

STEL: 10mg/m3

○ NIOSH: TWA: 5mg/m3

STEL: 10mg/m3

- O Biological exposure limits: No data
- 2) Zinc Alkyl Dithiophosphate
 - ACGIH: No data
 - O Biological exposure limits: No data
- 3) Alkenoic Acid Ester, Borated
 - ACGIH : No data
 - O Biological exposure limits: No data
- 4) Additive mixture (S1)
 - O ACGIH: No data
 - O 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:
 - O 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

O 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.

O Hands protection :

Use proper chemical resistant gloves.

O Human body protection :

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 : 220°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℃

12) Solubility: No data

13) Vapor density: No data

14) Relative density: 0.8525 Kg/L @ 15°C

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

16) Auto-ignition temperature :> 260°C

17) Decomposition temperature: No data

18) Viscosity: 10.29 cSt @ 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 :
 - 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. Inf	ormation on the likely routes of exposure
\circ	Inhalation : May cause slight irritation
\bigcirc	Ingestion: May cause vomit, coughing, shortness of breath, dizziness.
\bigcirc	Skin contact: May cause slight skin irritation.
\bigcirc	Eve contact: May cause slight eve irritation.

- B. Delayed and immediate effects and chronic effectsfrom short or long term exposure
- 1) Distillates, Hydrotreated Heavy Paraffinic
 - 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)
 - O Serious eye damage/eye irritation : No irritating (Rabbit)
 - O Respiratory sensitization: Not determined (guinea pig)
 - O Skin sensitization: Not determined (guinea pig)
 - \bigcirc Carcinogenicity : MOL, OSHA, IARC : No data
 - Germ cell mutagenicity : Negative (Ames test)
 - O Reproductive toxicity: No data
 - O Specific target organ systemic toxicity(single exposure) : No data
 - O Specific target organ systemic toxicity(repeated exposure): No data
 - O Aspiration hazard: No data
- 2) Zinc Alkyl 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)
 - O Serious eye damage/eye irritation: No irritating (Rabbit)

○ Respiratory sensitization : I	Not determined (quinea pig)	
Skin sensitization : Not det		
○ Carcinogenicity : MOL, OSI		
○ Germ cell mutagenicity : N		
Reproductive toxicity : No	data	
 Specific target organ syste 	mic toxicity(single exposure) : No data	
 Specific target organ syste 	mic toxicity(repeated exposure) : No data	
Aspiration hazard : No dat	a	
3) Alkenoic Acid Ester, Borated		
Acute oral toxicity		
- Oral : LD50 > 5000mg/bv	v Rat	
- Dermal : LD50 > 5000mg		
- Inhalation: LC50 = 50mg		
Skin corrosion/irritation : N		
	ritation : No irritating (Rabbit)	
○ Respiratory sensitization : I	-	
○ Skin sensitization : Not det	termined (guinea pig)	
○ Carcinogenicity : MOL, OSI	HA, IARC : No data	
○ Germ cell mutagenicity : N	legative (Ames test)	
Reproductive toxicity : No	data	
	mic toxicity(single exposure) : No data	
	mic toxicity(repeated exposure) : No data	
Aspiration hazard : No dat	a	
4) Additive mixture (S1)		
 ○ Acute oral toxicity 		
- Oral : No data		
- Dermal : No data		
- Inhalation: No data		
\bigcirc Skin corrosion/irritation : N	No irritating (Rabbit)	
○ Serious eye damage/eye ir	ritation : No irritating (Rabbit)	
○ Respiratory sensitization : I		
Skin sensitization : Not det		
Carcinogenicity : MOL, OSI		
○ Germ cell mutagenicity : N		
Reproductive toxicity : No Specific torget organ system		
	mic toxicity(single exposure) : No data mic toxicity(repeated exposure) : No data	
Specific target organ systeAspiration hazard : No dat	• • •	
O /ispiration nazara . No dat	<u> </u>	
C. Numerical measures of toxicity	y(such as ATE) : No data	
12. Ecological Information		
12. Leological Information		
A. Hazardous to the aquatic envi	ironment :	
1) Distillates, Hydrotreated He	avy Paraffinic	
○ Fish :	No data	
○ Crustacea :	No data	
○ Algea :	No data	
2) Zinc Alkyl dithiophosphate		

 ○ Fish: ○ Crustacea: ○ Algea: 3) Alkenoic Acid Ester, Borated ○ Fish: ○ Crustacea: ○ Algea: 4) Additive mixture (S1) ○ Fish: ○ Crustacea: ○ Algea: 	No data
B. Persistence and degradability 1) Distillates, Hydrotreated Hea - No data 2) Zinc Alkyl dithiophosphate - No data 3) Alkenoic Acid Ester, Boratec - No data 4) Additive mixture (S1) - No data	avy Paraffinic
C. Bioaccumulative potential 1) Distillates, Hydrotreated Hea - Bioaccumulation: 6% (28 2) Zinc Alkyl dithiophosphate - No data 3) Alkenoic Acid Ester, Boratec - No data 4) Additive mixture (S1) - No data	day, aerotropism, domestic waste water, not disassemble)
 D. Mobility in soil : 1) Distillates, Hydrotreated Heat - No data 2) Zinc Alkyl dithiophosphate - No data 3) Alkenoic Acid Ester, Borated - No data 4) 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
 - Zinc Alkyl dithiophosphate: No data
 - Alkenoic Acid Ester, Borated: toxic material
 - Additive mixture (S1): No data
- C. Wastes control act (Korea)
 - Distillates, Hydrotreated Heavy Paraffinic : No data
 - Zinc Alkyl dithiophosphate: No data
 - Alkenoic Acid Ester, Borated: toxic material
 - Additive mixture (S1): No data
- D. Hazardous material safety act (Korea)
 - Distillates, Hydrotreated Heavy Paraffinic : No data
 - Zinc Alkyl dithiophosphate: No data
 - Alkenoic Acid Ester, Borated: 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
 - O U.S. acts
 - OSHA (29CFR1910.119):

- 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) Zinc Alkyl dithiophosphate

○ EU classification

Classification: Not determinedRisk Phrases: Not determinedSafety Phrases: Not determined

O 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) Alkenoic Acid Ester, Borated

○ EU classification

Classification: Not determinedRisk Phrases: Not determinedSafety 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) Additive mixture (S1)

○ EU classification

Classification: Not determinedRisk Phrases: Not determinedSafety Phrases: Not determined

U.S. acts

- OSHA (29CFR1910.119):

OSHA (29CFR1910.119):

Not determined

OSHA (29CFR302.4):

Not determined

EPCRA 302 (40CFR355.30):

POSHA (29CFR355.30):

Not determined

EPCRA 304 (40CFR355.40):

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)

Team	Date of first preparation	Date of last revision	Revision Number
Finished Lubricants R&D Team	2012-11-30	2017-10-26	4

Kixx G1 SN 5W-40

1. Chemical Product and Company Information

1) Product: Kixx G1 SN 5W-40

Product

2) Recommended use of the chemical and restrictions on use

O Recommended use: Lubricants, Gasoline Engine Oil

O Restrictions on use :

3) Manufacture/Supplier information

Supply company : GS Caltex Corporation

○ Address : Nonhyeon-ro 508(Yeoksam-dong), Gangnam-gu, Seoul, South Korea

 \bigcirc Information service or emergency call : 82-2-1899-5145

O 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
 - O Symbol: No symbol
 - O 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

NFPA Component	Health	Fire	Reactivity
1. Distillates, Hydrotreated Heavy Paraffinic	1	1	0
2. Zinc Alkyl Dithiophosphate	1	1	0
3. Alkenoic Acid Ester, Borated	1	1	0
4. Additive mixture (S1)	1	1	0

3. Composition and Information on Ingredients

Component	Synonyms	CAS No.	Content(%)
Distillates, Hydrotreated Heavy Paraffinic	Hydrotreated (severe) heavy paraffinic distillate	64742-54-7	68 ~ 80
2. Zinc Alkyl Dithiophosphate	Phosphorodithioic acid	68649-42-3	< 1
3. Alkenoic Acid Ester, Borated	Polyhydroxy Ester Borated	Not Determined	< 1
4. Additive mixture (S1)	Not Applicable	Not Determined	10 ~ 25

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) Recommanded(or prohibited) extinguishing media
 - O Recommanded extinguishing media:
 - Dry chemicals, CO2, water spray, fire fighting foam
 - O Prohibited extinguishing media:
 - High pressure water shoot
 - Large fire :
 - fire fighting foam or water spray
- 2) Specific hazard from chemical material
 - O Toxicant from combustion : Carbon oxides
 - O 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 Stroage

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) 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

 \bigcirc ACGIH : TWA : 5mg/m3

STEL: 10mg/m3

○ NIOSH: TWA: 5mg/m3

STEL: 10mg/m3

O Biological exposure limits: No data

2) Zinc Alkyl Dithiophosphate

○ ACGIH: No data

O Biological exposure limits: No data

3) Alkenoic Acid Ester, Borated

○ ACGIH : No data

O Biological exposure limits: No data

4) Additive mixture (S1)

O ACGIH: No data

O 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:
 - O 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

O 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.

O 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: 220°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℃

12) Solubility: No data

13) Vapor density: No data

14) Relative density: 0.8525 Kg/L @ 15°C

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

16) Auto-ignition temperature :> 260°C

17) Decomposition temperature: No data

18) Viscosity: 14.9 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:

○ Aspiration hazard : No data

11. ¹

	- Carbon oxides
То	xicological Information
۹. I	nformation 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.
3. C	Delayed and immediate effects and chronic effectsfrom short or long term exposure
	Distillates, Hydrotreated Heavy Paraffinic 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
	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

	bw Rabbit (/L (4hr) Rat o irritating (Rabbit) ritation : No irritating (Rabbit) Not determined (guinea pig) ermined (guinea pig) HA, IARC : No data egative (Ames test) data mic toxicity(single exposure) : No data
	mic toxicity(repeated exposure) : No data
Aspiration hazard : No data	
Specific target organ systerAspiration hazard : No data	ritation: No irritating (Rabbit) Not determined (guinea pig) ermined (guinea pig) HA, IARC: No data egative (Ames test) data mic toxicity(single exposure): No data mic toxicity(repeated exposure): No data
C. Numerical measures of toxicity	v(such as ATE) : No data
Facility of the C	
. Ecological Information	
A. Hazardous to the aquatic envii	avy Paraffinic
-	No data
-	No data
2) Zinc Alkyl dithiophosphate	TVO data
• • •	No data
○ Crustacea :	No data
- 5	No data
3) Alkenoic Acid Ester, Borated	
○ Fish:	No data
Crustacea :	No data

 \bigcirc Algea :

No data

- 4) Additive mixture (S1)
 - Fish: No dataCrustacea: No dataAlgea: No data
- B. Persistence and degradability:
 - 1) Distillates, Hydrotreated Heavy Paraffinic
 - No data
 - 2) Zinc Alkyl dithiophosphate
 - No data
 - 3) Alkenoic Acid Ester, Borated
 - No data
 - 4) Additive mixture (S1)
 - No data
- C. Bioaccumulative potential
 - 1) Distillates, Hydrotreated Heavy Paraffinic
 - Bioaccumulation : 6% (28 day, aerotropism, domestic waste water, not disassemble)
 - 2) Zinc Alkyl dithiophosphate
 - No data
 - 3) Alkenoic Acid Ester, Borated
 - No data
 - 4) Additive mixture (S1)
 - No data
- D. Mobility in soil:
 - 1) Distillates, Hydrotreated Heavy Paraffinic
 - No data
 - 2) Zinc Alkyl dithiophosphate
 - No data
 - 3) Alkenoic Acid Ester, Borated
 - No data
 - 4) 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
 - Zinc Alkyl dithiophosphate: No data
 - Alkenoic Acid Ester, Borated: toxic material
 - Additive mixture (S1): No data
- C. Wastes control act (Korea)
 - Distillates, Hydrotreated Heavy Paraffinic : No data
 - Zinc Alkyl dithiophosphate: No data
 - Alkenoic Acid Ester, Borated: toxic material
 - Additive mixture (S1): No data
- D. Hazardous material safety act (Korea)
 - Distillates, Hydrotreated Heavy Paraffinic : No data
 - Zinc Alkyl dithiophosphate: No data
 - Alkenoic Acid Ester, Borated: 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) Zinc Alkyl dithiophosphate

○ EU classification

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

O 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) Alkenoic Acid Ester, Borated

○ EU classification

Classification: Not determinedRisk Phrases: Not determinedSafety Phrases: Not determined

U.S. acts

- OSHA (29CFR1910.119):

- CERCLA 103 (40CFR302.4):

- EPCRA 302 (40CFR355.30):

- EPCRA 304 (40CFR355.40):

- EPCRA 313 (40CFR372.65):

Not determined

Not determined

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

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 (4)

4) Others:

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



Material Safety Data Sheet (MSDS)

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

Kixx G1 SN 5W-50

1. Chemical Product and Company Information

1) Product: Kixx G1 SN 5W-50

Product

2) Recommended use of the chemical and restrictions on use

O Recommended use: Lubricants, Gasoline Engine Oil

O Restrictions on use :

3) Manufacture/Supplier information

Supply company : GS Caltex Corporation

○ Address : Nonhyeon-ro 508(Yeoksam-dong), Gangnam-gu, Seoul, South Korea

 \bigcirc Information service or emergency call : 82-2-1899-5145

O 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
 - O 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

NFPA Component	Health	Fire	Reactivity
1. Distillates, Hydrotreated Heavy Paraffinic	1	1	0
2. Zinc Alkyl Dithiophosphate	1	1	0
3. Alkenoic Acid Ester, Borated	1	1	0
4. Additive mixture (S1)	1	1	0

3. Composition and Information on Ingredients

Component	Synonyms	CAS No.	Content(%)
Distillates, Hydrotreated Heavy Paraffinic	Hydrotreated (severe) heavy paraffinic distillate	64742-54-7	63 ~ 75
2. Zinc Alkyl Dithiophosphate	Phosphorodithioic acid	68649-42-3	< 1
3. Alkenoic Acid Ester, Borated	Polyhydroxy Ester Borated	Not Determined	< 1
4. Additive mixture (S1)	Not Applicable	Not Determined	15 ~ 30

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) Recommanded(or prohibited) extinguishing media
 - O Recommanded extinguishing media:
 - Dry chemicals, CO2, water spray, fire fighting foam
 - O Prohibited extinguishing media:
 - High pressure water shoot
 - Large fire :
 - fire fighting foam or water spray
- 2) Specific hazard from chemical material
 - O Toxicant from combustion : Carbon oxides
 - O 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 Stroage

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) 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

 \bigcirc ACGIH : TWA : 5mg/m3

STEL: 10mg/m3

○ NIOSH: TWA: 5mg/m3

STEL: 10mg/m3

- O Biological exposure limits: No data
- 2) Zinc Alkyl Dithiophosphate
 - ACGIH: No data
 - O Biological exposure limits: No data
- 3) Alkenoic Acid Ester, Borated
 - ACGIH : No data
 - O Biological exposure limits: No data
- 4) Additive mixture (S1)
 - O ACGIH: No data
 - O 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:
 - O 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

O 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.

O Hands protection :

Use proper chemical resistant gloves.

O Human body protection :

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 : 220°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℃

12) Solubility: No data

13) Vapor density: No data

14) Relative density: 0.8525 Kg/L @ 15°C

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

16) Auto-ignition temperature :> 260°C

17) Decomposition temperature: No data

18) Viscosity: 18.5 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:

○ Aspiration hazard : No data

11. ¹

,	- Carbon oxides
T	oxicological Information
۹.	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.
3.	Delayed and immediate effects and chronic effectsfrom short or long term exposure
L)	Distillates, Hydrotreated Heavy Paraffinic 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
2)	Zinc Alkyl 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

, ,	g/bw Rabbit g/L (4hr) Rat No irritating (Rabbit) rritation : No irritating (Rabbit) Not determined (guinea pig) etermined (guinea pig) HA, IARC : No data Negative (Ames test)		
	emic toxicity(single exposure) : No data emic toxicity(repeated exposure) : No data ta		
4) Additive mixture (S1)			
○ Acute oral toxicity			
- Oral : No data			
- Dermal : No data			
- Inhalation : No data○ Skin corrosion/irritation : I	No irritating (Rabbit)		
	rritation : No irritating (Rabbit)		
	Not determined (guinea pig)		
Skin sensitization : Not de	etermined (guinea pig)		
○ Carcinogenicity : MOL, OSHA, IARC : No data			
O Germ cell mutagenicity: Negative (Ames test) O Penroductive toxicity: Negative O Penroductive toxicity: Negative			
 Reproductive toxicity: No data Specific target organ systemic toxicity(single exposure): No data 			
Specific target organ systemic toxicity(single exposure) : No dataSpecific target organ systemic toxicity(repeated exposure) : No data			
Aspiration hazard : No da	· · · · · · · · · · · · · · · · · · ·		
•			
C. Numerical measures of toxici	ty(such as ATE) : No data		
Ecological Information			
Ecological Information			
A. Hazardous to the aquatic env 1) Distillates, Hydrotreated He			
○ Fish :	No data		
○ Crustacea :	No data		
○ Algea:	No data		
2) Zinc Alkyl dithiophosphate	NIs slate		
○ Fish :○ Crustacea :	No data No data		
○ Algea :	No data		
3) Alkenoic Acid Ester, Borate			
○ Fish :	No data		
○ Crustacea :	No data		
○ Algea :	No data		
4) Additive mixture (S1)			

○ Fish :	No data
○ Crustacea :	No data
○ Algea :	No data

- B. Persistence and degradability:
 - 1) Distillates, Hydrotreated Heavy Paraffinic
 - No data
 - 2) Zinc Alkyl dithiophosphate
 - No data
 - 3) Alkenoic Acid Ester, Borated
 - No data
 - 4) Additive mixture (S1)
 - No data
- C. Bioaccumulative potential
 - 1) Distillates, Hydrotreated Heavy Paraffinic
 - Bioaccumulation : 6% (28 day, aerotropism, domestic waste water, not disassemble)
 - 2) Zinc Alkyl dithiophosphate
 - No data
 - 3) Alkenoic Acid Ester, Borated
 - No data
 - 4) Additive mixture (S1)
 - No data
- D. Mobility in soil:
 - 1) Distillates, Hydrotreated Heavy Paraffinic
 - No data
 - 2) Zinc Alkyl dithiophosphate
 - No data
 - 3) Alkenoic Acid Ester, Borated
 - No data
 - 4) 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
 - Zinc Alkyl dithiophosphate: No data
 - Alkenoic Acid Ester, Borated: toxic material
 - Additive mixture (S1): No data
- C. Wastes control act (Korea)
 - Distillates, Hydrotreated Heavy Paraffinic : No data
 - Zinc Alkyl dithiophosphate: No data
 - Alkenoic Acid Ester, Borated: toxic material
 - Additive mixture (S1): No data
- D. Hazardous material safety act (Korea)
 - Distillates, Hydrotreated Heavy Paraffinic : No data
 - Zinc Alkyl dithiophosphate: No data
 - Alkenoic Acid Ester, Borated: 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) Zinc Alkyl dithiophosphate
 - EU classification

Classification : Not determinedRisk Phrases : Not determined

- Safety Phrases : Not determined

O 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) Alkenoic Acid Ester, Borated
- EU classification

Classification: Not determinedRisk Phrases: Not determinedSafety Phrases: Not determined

O U.S. acts

- OSHA (29CFR1910.119):

- CERCLA 103 (40CFR302.4):

- EPCRA 302 (40CFR355.30):

- EPCRA 304 (40CFR355.40):

- EPCRA 313 (40CFR372.65):

Not determined

Not determined

- 4) Additive mixture (S1)
 - EU classification

Classification: Not determinedRisk Phrases: Not determinedSafety 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:

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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 G1 SN 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
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1) Product: Kixx G1 SN 10W-30

2) Recommended use of the chemical and restrictions on use

O Recommended use: Lubricants, Gasoline Engine Oil

O Restrictions on use: None

3) Manufacture/Supplier information

O Supply company: GS Caltex Corporation

O Address: Nonhyeon-ro 508(Yeoksam-dong), Gangnam-gu, Seoul, South Korea

○ Information service or emergency call: 82-2-1899-5145

O 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
 - O Signal word: No signal word
 - O Hazard statement

Not classified under GHS criteria

- O 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

NFPA Component	Health	Fire	Reactivity
Distillates, Hydrotreated Heavy Paraffinic	0	1	0
2. Zinc Alkyl Dithiophosphate	1	1	0
3. Alkenoic Acid Ester, Borated	1	1	0
4. Additive mixture (S1)	1	1	0

3. Composition and Information on Ingredients

Component	Synonyms	CAS No.	Content(%)
Distillates, Hydrotreated Heavy Paraffinic	Hydrotreated (severe) heavy paraffinic distillate	64742-54-7	80 ~ 90
2. Zinc Alkyl Dithiophosphate	Phosphorodithioic acid	68649-42-3	< 1
3. Alkenoic Acid Ester, Borated	Polyhydroxy Ester Borated	Not Determined	< 1
4. Additive mixture (S1)	Not Applicable	Not Determined	5 ~ 15

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) Recommanded(or prohibited) extinguishing media
 - O Recommanded extinguishing media:
 - Dry chemicals, CO2, water spray, fire fighting foam
 - O Prohibited extinguishing media:
 - High pressure water shoot
 - O Large fire:
 - fire fighting foam or water spray
- 2) Specific hazard from chemical material
 - O Toxicant from combustion: Carbon oxides
 - O 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.

- 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
 - O 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 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) Stroage:
Stroage in closed containers. Stroage in cool and dry areas.
Ventilation keeps it in a region
Keep away from prohibited materials for mixing.
Exposure Control and Personal Protection
A. Exposure limits and biological exposure limits of chemical
1) Distillates, Hydrotreated Heavy Paraffinic
○ NIOSH : No data○ Biological exposure limits : No data
2) Zinc Alkyl Dithiophosphate
○ NIOSH: No data
○ Biological exposure limits : No data
3) Alkenoic Acid Ester, Borated
○ ACGIH : No data○ NIOSH : No data
O Biological exposure limits : No data
4) Additive mixture (S1)
○ ACGIH : No data○ NIOSH : 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.

O 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 : 220°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℃

12) Solubility: No data

13) Vapor density: No data

14) Relative density: 0.8672 Kg/L @ 15°C

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

16) Auto-ignition temperature ⇒ 260°C

17) Decomposition temperature: No data

18) Viscosity : 9.912 cSt @ 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 :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 effectsfrom short or long term exp	oosure
1) Distillates, Hydrotreated Heavy Paraffinic Acute oral toxicity Oral: LD50 > 5000mg/bw Rat Dermal: LD50 > 5000mg/bw Rabbit Inhalation: LC50 = 2.18mg/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) Zinc Alkyl dithiophosphate Acute oral toxicity Oral: Data not available Dermal: Data not available Inhalation: Data not available Skin corrosion/irritation: Expected to be slightly irritating (Rabbit) Serious eye damage/eye irritation: Expected to be slightly irritating (Rabbit) Respiratory sensitization: Not determined (guinea pig) Skin sensitization: Not determined (guinea pig) 	:)

Carcinogenicity: MOL, C	SHA, IARC: No data
Germ cell mutagenicity :	Negative (Ames test)
Reproductive toxicity: No	o data
 Specific target organ sys 	stemic toxicity(single exposure): Expected to be slightly irritating
O Specific target organ sys	stemic toxicity(repeated exposure): No data
Aspiration hazard : No da	
C Aspiration nazara: No de	ata
0) 411	
3) Alkenoic Acid Ester, Borated	
Acute oral toxicity	
- Oral: No data	
- Dermal : No data	
- Inhalation: No data	
Skin corrosion/irritation :	No irritating (Rabbit)
	irritation: No irritating (Rabbit)
	: Not determined (guinea pig)
○ Skin sensitization: Not d	
O Carcinogenicity: MOL, C	
Germ cell mutagenicity:	-
Reproductive toxicity : No	o data
 Specific target organ sys 	temic toxicity(single exposure): No data
 Specific target organ sys 	stemic toxicity(repeated exposure): No data
Aspiration hazard : No da	ata
 Respiratory sensitization Skin sensitization : Not d Carcinogenicity : MOL, C Germ cell mutagenicity : Reproductive toxicity : Not d Specific target organ system 	irritation: No irritating (Rabbit) : Not determined (guinea pig) etermined (guinea pig) DSHA, IARC: No data Negative (Ames test) to data etemic toxicity(single exposure): No data estemic toxicity(repeated exposure): No data eata
10.5	
12. Ecological Information	
A Hozordoue to the counti-	avironment :
A. Hazardous to the aquatic er	
1) Distillates, Hydrotreated F	-
○ Fish:	No data
○ Crustacea:	No data
○ Algea:	No data

 2) Zinc Alkyl dithiophosphate Fish: Crustacea: Algea: Alkenoic Acid Ester, Borate Fish: Crustacea: 	No data No data
○ Algea: 4) Additive mixture (S1)	No data
○ Fish:	No data
○ Crustacea:	No data
○ Algea:	No data
 B. Persistence and degradability 1) Distillates, Hydrotreated He - No data 2) Zinc Alkyl dithiophosphate - No data 3) Alkenoic Acid Ester, Borate - No data 4) Additive mixture (S1) - No data 	eavy Paraffinic
C. Bioaccumulative potential 1) Distillates, Hydrotreated He - Bioaccumulation: 6% (2 2) Zinc Alkyl dithiophosphate - BCF 3.162 3) Alkenoic Acid Ester, Borate - No data 4) Additive mixture (S1) - No data	28 day, aerotropism, domestic waste water, not disassemble)
D. Mobility in soil:	
 Distillates, Hydrotreated Here - No data Zinc Alkyl dithiophosphate - No data Alkenoic Acid Ester, Borate - No data 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
 - Zinc Alkyl dithiophosphate: No data
 - Alkenoic Acid Ester, Borated: No data
 - 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
 - Zinc Alkyl dithiophosphate: No data
 - Alkenoic Acid Ester, Borated: No data
 - Additive mixture (S1): No data
- E. Other internal and foreign acts
 - 1) Distillates, Hydrotreated Heavy Paraffinic

O EU classification

Classification:
 Risk Phrases:
 Not determined
 Not determined
 Not determined

O U.S. acts

- OSHA (29CFR1910.119):

- CERCLA 103 (40CFR302.4):

- EPCRA 302 (40CFR355.30):

- EPCRA 304 (40CFR355.40):

- EPCRA 313 (40CFR372.65):

Not determined

Not determined

2) Zinc Alkyl dithiophosphate

O EU classification

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

O U.S. acts

- OSHA (29CFR1910.119):

- CERCLA 103 (40CFR302.4):

- EPCRA 302 (40CFR355.30):

- EPCRA 304 (40CFR355.40):

- EPCRA 313 (40CFR372.65):

Not determined

Not determined

3) Alkenoic Acid Ester, Borated

O EU classification

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

O U.S. acts

- OSHA (29CFR1910.119):

- CERCLA 103 (40CFR302.4):

- EPCRA 302 (40CFR355.30):

- EPCRA 304 (40CFR355.40):

- EPCRA 313 (40CFR372.65):

Not determined

Not determined

4) Additive mixture (S1)

O EU classification

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

O U.S. acts

- OSHA (29CFR1910.119):

- CERCLA 103 (40CFR302.4):

- EPCRA 302 (40CFR355.30):

- EPCRA 304 (40CFR355.40):

- EPCRA 313 (40CFR372.65):

Not determined

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)

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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)

|--|

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 G1 SN 10W-40

2) Recommended use of the chemical and restrictions on use

O Recommended use: Lubricants, Gasoline Engine Oil

O Restrictions on use: None

3) Manufacture/Supplier information

O Supply company: GS Caltex Corporation

O Address: Nonhyeon-ro 508(Yeoksam-dong), Gangnam-gu, Seoul, South Korea

○ Information service or emergency call: 82-2-1899-5145

O 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
 - O Signal word: No signal word
 - O Hazard statement

Not classified under GHS criteria

- O 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

NFPA Component	Health	Fire	Reactivity
Distillates, Hydrotreated Heavy Paraffinic	0	1	0
2. Zinc Alkyl Dithiophosphate	1	1	0
3. Alkenoic Acid Ester, Borated	1	1	0
4. Additive mixture (S1)	1	1	0

3. Composition and Information on Ingredients

Component	Synonyms	CAS No.	Content(%)
Distillates, Hydrotreated Heavy Paraffinic	Hydrotreated (severe) heavy paraffinic distillate	64742-54-7	67 ~ 80
2. Zinc Alkyl Dithiophosphate	Phosphorodithioic acid	68649-42-3	< 1
3. Alkenoic Acid Ester, Borated	Polyhydroxy Ester Borated	Not Determined	< 1
4. Additive mixture (S1)	Not Applicable	Not Determined	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) Recommanded(or prohibited) extinguishing media
 - O Recommanded extinguishing media:
 - Dry chemicals, CO2, water spray, fire fighting foam
 - O Prohibited extinguishing media:
 - High pressure water shoot
 - O Large fire:
 - fire fighting foam or water spray
- 2) Specific hazard from chemical material
 - O Toxicant from combustion: Carbon oxides
 - O 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.
- 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 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) Stroage: Stroage in closed containers. Stroage in cool and dry areas. Ventilation keeps it in a region Keep away from prohibited materials for mixing. Exposure Control and Personal Protection A. Exposure limits and biological exposure limits of

O Hands protection:

3. Exposure Control and Personal Protection
A. Exposure limits and biological exposure limits of chemical
 1) Distillates, Hydrotreated Heavy Paraffinic ○ ACGIH: No data ○ NIOSH: No data ○ Biological exposure limits: No data
 2) Zinc Alkyl Dithiophosphate ACGIH: No data NIOSH: No data Biological exposure limits: No data
 3) Alkenoic Acid Ester, Borated ACGIH: No data NIOSH: No data Biological exposure limits: No data
 4) Additive mixture (S1) ACGIH : No data NIOSH : 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 requirement 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.

Use proper chemical resistant gloves.

O 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 : 220°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℃

12) Solubility: No data

13) Vapor density: No data

14) Relative density: 0.8678 Kg/L @ 15°C

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

16) Auto-ignition temperature ⇒ 260°C

17) Decomposition temperature: No data

18) Viscosity: 15.24 cSt @ 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 :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 effectsfrom short or long term exposure
1) Distillates, Hydrotreated Heavy Paraffinic Acute oral toxicity Oral: LD50 > 5000mg/bw Rat Dermal: LD50 > 5000mg/bw Rabbit Inhalation: LC50 = 2.18mg/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) Zinc Alkyl dithiophosphate Acute oral toxicity Oral: Data not available Dermal: Data not available Inhalation: Data not available Skin corrosion/irritation: Expected to be slightly irritating (Rabbit) Serious eye damage/eye irritation: Expected to be slightly 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): Expected to be slightly irritating Specific target organ systemic toxicity(repeated exposure): No data Aspiration hazard: No data
 3) Alkenoic Acid Ester, Borated 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) 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
12. Ecological Information
A. Hazardous to the aquatic environment: 1) Distillates, Hydrotreated Heavy Paraffinic

∪ Algea :	No data
2) Zinc Alkyl dithiophosph	ate
○ Fish:	No data
○ Crustacea:	No data
○ Algea:	No data
3) Alkenoic Acid Ester, Bo	
○ Fish:	No data
○ Crustacea:	No data
O Algea:	No data
4) Additive mixture (S1)	No data
O Fish:	No data
O Crustacea:	No data
	No data
○ Algea:	No data
B. Persistence and degrada	bility:
Distillates, Hydrotreated	
- No data	Theavy Faranninc
2) Zinc Alkyl dithiophosph	ata
- No data	ate
	and a d
3) Alkenoic Acid Ester, Bo	rated
- No data	
4) Additive mixture (S1)	
- No data	
C. Bioaccumulative potentia	ı
·	
1) Distillates, Hydrotreated	
	% (28 day, aerotropism, domestic waste water, not disassemble)
2) Zinc Alkyl dithiophosph	ate
- BCF 3.162	
3) Alkenoic Acid Ester, Bo	rated
- No data	
4) Additive mixture (S1)	
- No data	
D. Madallita da anti-	
D. Mobility in soil:	
1) Distillates, Hydrotreated	d Heavy Paraffinic
- No data	
2) Zinc Alkyl dithiophosph	ate
- No data	
3) Alkenoic Acid Ester, Bo	vrated
- No data	
4) Additive mixture (S1)	
- No data	
5 OH	
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

- B. Chemical control act (Korea)
 - Distillates, Hydrotreated Heavy Paraffinic: No data
 - Zinc Alkyl dithiophosphate: No data
 - Alkenoic Acid Ester, Borated: No data
 - 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
 - Zinc Alkyl dithiophosphate: No data
 - Alkenoic Acid Ester, Borated: No data
 - Additive mixture (S1): No data
- E. Other internal and foreign acts
 - 1) Distillates, Hydrotreated Heavy Paraffinic
 - EU classification

Classification: Not determinedRisk Phrases: Not determinedSafety Phrases: Not determined

O U.S. acts

- OSHA (29CFR1910.119):

- CERCLA 103 (40CFR302.4):

- EPCRA 302 (40CFR355.30):

- EPCRA 304 (40CFR355.40):

- EPCRA 313 (40CFR372.65):

Not determined

Not determined

2) Zinc Alkyl dithiophosphate

O EU classification

Classification:Not determinedRisk Phrases:Not determinedNot determined

O U.S. acts

- OSHA (29CFR1910.119):

- 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) Alkenoic Acid Ester, Borated

O EU classification

Classification:
Risk Phrases:
Not determined
Not determined
Not determined

O U.S. acts

- OSHA (29CFR1910.119):

- CERCLA 103 (40CFR302.4):

- EPCRA 302 (40CFR355.30):

- EPCRA 304 (40CFR355.40):

- EPCRA 313 (40CFR372.65):

Not determined

Not determined

4) Additive mixture (S1)

O EU classification

Classification:Not determinedRisk Phrases:Not determinedNot determined

O U.S. acts

- OSHA (29CFR1910.119):

- 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 G1 SN 20W-50
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Team	Date of first preparation	Date of last revision	Revision Number
Finished Lubricants R&D Team	2013-07-01	2017-10-26	4

1. Chemical Product and Company Information

1) Product: Kixx G1 SN 20W-50

2) Recommended use of the chemical and restrictions on use

O Recommended use: Lubricants, Gasoline Engine Oil (4 Stroke Motocycle)

O Restrictions on use :

3) Manufacture/Supplier information

Supply company: GS Caltex Corporation

○ Address : Nonhyeon-ro 508(Yeoksam-dong), Gangnam-gu, Seoul, South Korea

O Information service or emergency call: 82-2-1899-5145

O 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
 - O Signal word: No signal word
 - Hazard statement

Not classified under GHS criteria

- O 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

NFPA Component	Health	Fire	Reactivity
1. Distillates, Hydrotreated Heavy Paraffinic	0	1	0
2. Zinc Alkyl Dithiophosphate	1	1	0
3. Additive mixture (S1-LOA-964)	1	1	0
4. Additive mixture (S2-LOA-701)	1	1	0

3. Composition and Information on Ingredients

Component	Synonyms	CAS No.	Content(%)
1. Distillates, Hydrotreated Heavy	Hydrotreated (severe)	64742-54-7	67.0 ~ 85.0
Paraffinic (Base Oil)	heavy paraffinic distillate	04/42-34-7	07.0 ~ 03.0
2. Zinc Alkyl Dithiophosphate	Phosphorodithioic acid	84605-29-8	0.01 ~ 0.1
3. Additive mixture (S1)	Not Applicable	Mixture	4.0 ~ 7.0
4. Additive mixture (S2)	Not Applicable	Mixture	5.0 ~ 9.0

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) Recommanded(or prohibited) extinguishing media
 - O Recommanded extinguishing media:
 - Dry chemicals, CO2, water spray, fire fighting foam
 - O Prohibited extinguishing media:
 - High pressure water shoot
 - Large fire :
 - fire fighting foam or water spray
- 2) Specific hazard from chemical material
 - O Toxicant from combustion: Carbon oxides
 - O 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
 - O 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 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) 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: TWA: 5mg/m3

STEL: 10mg/m3

○ NIOSH: TWA: 5mg/m3

STEL: 10mg/m3

- O Biological exposure limits: No data
- 2) Zinc Alkyl Dithiophosphate

○ ACGIH : No data

O Biological exposure limits: No data

3) Additive mixture (S1)

○ ACGIH : No data

O Biological exposure limits: No data

4) Additive mixture (S2)

○ ACGIH: No data

O 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:
 - O 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

O 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.

O 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: 242°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℃

12) Solubility: No data

13) Vapor density: No data

14) Relative density: 0.8737 Kg/L @ 15°C

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

16) Auto-ignition temperature :> 260°C

17) Decomposition temperature: No data

18) Viscosity: 18.58 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.
В.	Delayed and immediate effects and chronic effectsfrom short or long term
1)	Distillates, Hydrotreated Heavy Paraffinic 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
2)	Zinc Alkyl 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)

O Respiratory sensitization : Not determined (guinea pig)

exposure

Carcinogenicity: MOLGerm cell mutagenicitReproductive toxicity:Specific target organs	cy : Negative (Ames test) : No data systemic toxicity(single exposure) : No data systemic toxicity(repeated exposure) : No data	
4) Additive mixture (S2)	, 55.5	
4) AUUIIIVE IIIXIUIE (SZ)		
 Acute oral toxicity Oral: No data Dermal: No data Inhalation: No data Skin corrosion/irritatio Serious eye damage/e Respiratory sensitizatio Skin sensitization: No Carcinogenicity: MOL Germ cell mutagenicit Reproductive toxicity: Specific target organ 	on: No irritating (Rabbit) eye irritation: No irritating (Rabbit) on: Not determined (guinea pig) ot determined (guinea pig) of, OSHA, IARC: No data ey: Negative (Ames test) of: No data esystemic toxicity(single exposure): No data esystemic toxicity(repeated exposure): No data	
	· · · · · · · · · · · · · · · · · · ·	
C. Numerical measures of to	oxicity(such as ATE) : No data	
2. Ecological Information	on	
A. Hazardous to the aquatic	environment :	
1) Distillates, Hydrotreated		
○ Fish :	No data	
_		
() Crustacea:	No data	
○ Crustacea :○ Algea :	No data No data	
○ Algea :	No data	
_	No data	
Algea :Zinc Alkyl dithiophosph	No data nate	
Algea :Zinc Alkyl dithiophosphFish :	No data nate No data	
Algea :Zinc Alkyl dithiophosphFish :Crustacea :	No data nate No data No data	
Algea :Zinc Alkyl dithiophosphFish :Crustacea :Algea :	No data nate No data No data	
 Algea: Zinc Alkyl dithiophosph Fish: Crustacea: Algea: Additive mixture (S1) 	No data nate No data No data No data	
 Algea: Zinc Alkyl dithiophosph Fish: Crustacea: Algea: Additive mixture (S1) Fish: 	No data No data No data No data No data No data	
 Algea: Zinc Alkyl dithiophosph Fish: Crustacea: Algea: Additive mixture (S1) Fish: Crustacea: 	No data	
 Algea: Zinc Alkyl dithiophosph Fish: Crustacea: Algea: Additive mixture (S1) Fish: Crustacea: Algea: 	No data	
 Algea: Zinc Alkyl dithiophosph Fish: Crustacea: Algea: Additive mixture (S1) Fish: Crustacea: Algea: 4) Additive mixture (S2)	No data	
 Algea: Zinc Alkyl dithiophosph Fish: Crustacea: Algea: Additive mixture (S1) Fish: Crustacea: Algea: 4) Additive mixture (S2) Fish: 	No data	

- No data
- 2) Zinc Alkyl dithiophosphate
- No data 3) Additive mixture (S1)

- No data
- 4) Additive mixture (S2)
 - No data
- C. Bioaccumulative potential
 - 1) Distillates, Hydrotreated Heavy Paraffinic
 - Bioaccumulation : 6% (28 day, aerotropism, domestic waste water, not disassemble)
 - 2) Zinc Alkyl dithiophosphate
 - No data
 - 3) Additive mixture (S1)
 - No data
 - 4) Additive mixture (S2)
 - No data
- D. Mobility in soil:
 - 1) Distillates, Hydrotreated Heavy Paraffinic
 - No data
 - 2) Zinc Alkyl dithiophosphate
 - No data
 - 3) Additive mixture (S1)
 - No data
 - 4) Additive 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)

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

- B. Chemical control act (Korea)
 - Distillates, Hydrotreated Heavy Paraffinic : No data
 - Zinc Alkyl dithiophosphate: No data
 - Additive mixture (S1): No data
- C. Wastes control act (Korea)
 - Distillates, Hydrotreated Heavy Paraffinic : No data
 - Zinc Alkyl dithiophosphate : No data
 - Additive mixture (S1): No data
- D. Hazardous material safety act (Korea)
 - Distillates, Hydrotreated Heavy Paraffinic : No data
 - Zinc Alkyl dithiophosphate: No data
 - 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) Zinc Alkyl dithiophosphate
 - EU classification
 - Classification : Not determinedRisk Phrases : Not determinedSafety 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 determinedRisk Phrases : Not determinedSafety Phrases : Not determined
 - O 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) Additive mixture (S2)

○ EU classification

Classification : Not determinedRisk Phrases : Not determinedSafety Phrases : Not determined

O 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 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: 2013.07.01
- 3) Revised frequency and Date of preparation of the latest version of the MSDS: 2017-10-26 (4)

4) Others:

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