

Material Safety Data Sheet (MSDS)

Product	Kixx Brake DOT 3
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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 Brake DOT 3

- 2) Recommended use of the chemical and restrictions on use
 - Recommended use : Automotive Brake System
 - Restrictions on use : No data

- 3) Manufacturer information
 - Manufacturer : Dong-A special chemical Co.Ltd
 - Address : 441-32, Banje-Ri, Wongok-Myun, Ansong City, Kyungki-Do, 441-811, Korea
 - Information service or emergency call : +82-31-652-1301
 - Department in charge : R&D Center

- 4) Supplier information
 - Supply company : GS Caltex Corporation
 - Address : 679 Yoksam-dong, Kangnam-gu, Seoul, Korea
 - Information service or emergency call : 82-2-1899-5145
 - Department in charge : Finished Lubricants R&D Team

2. Hazards Identification

- 1) Classification of the substance or mixture
 - Reproductive toxicity substances Category 2

- 2) GHS labels, including precautionary statements
 - Symbol



- Signal word : Warning
- Hazard statement
 - H361 Suspected of damaging fertility or the unborn child
- Precautionary statement
 - Prevention
 - P201 Obtain special instructions before use.
 - P202 Do not handle until all safety precautions have been read and understood

- P280 Wear protective gloves/protective clothing/eye protection/face protection.
- Response
- P308+P313 IF exposed or concerned: Get medical advice/attention.
- Storage
- P405 Store locked up.
- Disposal
- P501 Dispose of contents/container to ...

3) Other hazards which do not result in classification

Component	NFPA	Health	Fire	Reactivity
- Diethylene glycol		1	1	0
- Triethyleneglycol monobutyl ether		2	1	0
- Methoxy triglycol		2	1	0
- Trade secrets		0	0	0

3. Composition and Information on Ingredients

Component	Synonyms	CAS No.	Content(%)
1) Diethylene glycol	2,2'-Oxybisethanol	111-46-6	40.0 ~ 45.0
2) Triethyleneglycol monobutyl ether	Triglycol monobutyl ether	143-22-6	15.0 ~ 20.0
3) Methoxy triglycol	Triethylene glycol monomethyl ether	112-35-6	35.0 ~ 40.0
4) Trade secrets	Trade secrets	Trade secrets	1.0 ~ 5.0

4. First Aid Measures

- 1) Eye contact :
 - Wash affected eyes for at least 15 minutes under running water with eyelids held open.
- 2) Skin contact :
 - Wash thoroughly with soap and water.
- 3) Inhalation :
 - Move to fresh air.
- 4) Ingestion :
 - Rinse mouth immediately and then drink plenty of water, seek medical attention.
- 5) Most important symptoms/effects, acute and delayed :
 - Consider the supply of oxygen.
- 6) First-aid treatment and information on medical doctors :
 - Treat symptomatically.
 - Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.

5. Fire Fighting Measures

1) Recommended(or prohibited) extinguishing media

Recommended extinguishing media :

– Dry extinguishing media, carbon dioxide, water spray, AFFF foam, alcohol-resistant foam

Prohibited extinguishing media :

– High pressure water shoot

Large fire :

– No Data. Water spray, alcohol-resistant foam

2) Specific hazard from chemical material

Thermal decomposition generate substances:

– Diethylene glycol: Carbon compounds

– Triethylene glycol monobutyl ether: Carbon compounds

– Methoxy triglycol: Carbon compounds

An explosion and fire risk :

– Ethylene glycol: A slight risk of fire

– Sodium Benzoate: A slight risk of fire

– Ionized water: A slight risk of fire

3) Special protective equipment.

If you can do without the risk of fire, the courage to move from the area.

Spray some substance to the pressurized water leakage, preventing them from scattering.

6. Accidental Release Measures

1) Necessary actions to protect human health :

– Eliminate all sources of ignition, adequate ventilation,

2) Necessary actions to protect the environment

– Do not abandon your product to rivers.

3) Purification and removal methods

– After absorbing material to absorb using the disposal, burning

7. Handling and Storage

1) Safety handling :

– Eyes, skin, clothes and to avoid contact

2) Storage :

– Store in a cool , dry place.

8. Exposure Control and Personal Protection

A. Exposure limits and biological exposure limits of chemical

1) Diethylene glycol

Domestic Policy : Not Applicable

ACGIH : No data

Biological exposure limits : No data

- 2) Triethyleneglycol monobutyl ether
- Domestic Policy : Not Applicable
 - ACGIH : No data
 - Biological exposure limits : No data

- 3) Methoxy triglycol
- Domestic Policy : Not Applicable
 - ACGIH : Not applicable
 - Biological exposure limits : Not applicable

- 4) Trade secrets
- Domestic Policy : No data
 - ACGIH : No data
 - Biological exposure limits : No data

B. Engineering management :

Ventilation: local exhaust ventilation system, install and maintain appropriate control over the wind speed to make it.

C. Personal protection equipment :

- Respiratory protection :
A mask poison prevention
- Eyes protection :
Safety glasses with side-shields(frame goggles)
- Hands protection :
Chemical resistance protective gloves
- Human body protection :
Wearing of closed work clothing is recommended.

9. Physical and Chemical Properties

- 1) Appearance : Amber liquid
- 2) Odor : No data
- 3) Odor threshold : No data
- 4) pH : 9~10
- 5) Melting point/freezing point : No data
- 6) Initial boiling point or boiling range : >230°C
- 7) Flash point : >140°C
- 8) Evaporation rate (BuAc=1) : No data
- 9) Flammability(solid, gas) : No data
- 10) Upper/lower flammability or explosive limits(LEL / UEL): 15 / 3 vol%

- 11) Vapor pressure : < 1 mbar (20°C)
 - 12) Solubility : soluble
 - 13) Vapor density : >1
 - 14) Relative density : 1.070 g/ ml (20°C)
 - 15) Partition coefficient: n-octano/water : No data
 - 16) Auto-ignition temperature : >200°C
 - 17) Decomposition temperature : No data
 - 18) Viscosity : 12 ~ 16 mm²/s (20°C)
 - 19) Molecular weight : No data
-

10. Stability and Reactivity

- 1) Chemical stability :
 - stable at room temperature.
 - 2) Toxicant generation possibility during reaction :
 - No hazardous reactions when stored and handled according to instructions.
 - 3) Prohibited conditions :
 - heat, lights, fire works
 - 4) Prohibited materials :
 - Oxidizers
 - 5) When hazardous substances produced by decomposition: carbon oxides
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11. Toxicological Information

A. Information on the likely routes of exposure

- Inhalation :
 - Diethylene glycol: Headache, sleepiness, dizziness
- Ingestion :
 - Diethylene glycol: Hypothermia, fever, blood pressure changes, vomiting, diarrhea, sleepiness, chest pain, shortness of breath, headache, dizziness, cramping, lethargy
 - Triethylene glycol monobutyl ether: Kidney pain
- Skin contact :
 - Diethylene glycol: Stimulus, absorbing
 - Triethylene glycol monobutyl ether: Stimulus
- Eye contact :
 - Diethylene glycol: Stimulus
 - Triethylene glycol monobutyl ether: Stimulus

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

- Acute Toxicity
 - Oral :
 - Diethylene glycol: LD50 12,565mg/kg(rat)
 - Triethylene glycol monobutyl ether: LD50 5,300mg/kg(rat)
 - Methoxy triglycol: LD50 11,300 µg/kg(rat)
 - Dermal :
 - Diethylene glycol: LD50 11,890mg/kg(rabbit)
 - Triethylene glycol monobutyl ether: LD50 2,000mg/kg(rabbit)
 - Methoxy triglycol: LD50 7,100 µg/kg(rat)
 - Inhalation :
 - Diethylene glycol: No data
 - Triethylene glycol monobutyl ether: No data
 - Methoxy triglycol: No data
- Skin Corrosion / irritation : No data
- Severe eye Damage/irritation : No data
- Respiratory sensitization : No data
- Skin sensitization : No data
- Carcinogenity : No data
- Germ cell mutagenity : No data
- Reproductive Toxicity :
 - Diethylene glycol: No data
 - Triethylene glycol monobutyl ether: No data
 - Methoxy triglycol: Toxic to Reproduction Category 2
- Specific target organ Toxicity(single exposure) : No data
- Specific target organ Toxicity(repeated exposure) : No data
- Aspiration toxicity : No data

12. Ecological Information

- A. Aquatic, terrestrial organisms toxicity : No data
 - Diethylene glycol: Fish: LC50 3,200mg/L/96h
- B. Persistence and degradability :
 - Triethylene glycol monobutyl ether: BOD5/COD = 0.16
- C. Bioaccumulative potential
 - No data
- D. Mobility in soil :
 - No data
- E. Other adverse effects :
 - No data

13. Disposal Considerations

- 1) Disposal methods :
 - Obsolete applied in accordance with regulations.

- 2) Disposal cautions :
Not Applicable

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 regulations

- Diethylene glycol
 - Measure workplace substance: Not Applicable
 - Destination management of hazardous substances: Not Applicable
 - Substance exposure standards set: Not Applicable
- Triethylene glycol monobutyl ether
 - Measure workplace substance: Not Applicable
 - Destination management of hazardous substances: Not Applicable
 - Substance exposure standards set: Not Applicable
- Methoxy triglycol
 - Measure workplace substance: Not Applicable
 - Destination management of hazardous substances: Not Applicable
 - Substance exposure standards set: Not Applicable

B. Chemical control act (Korea)

- Diethylene glycol: Not Applicable
- Triethylene glycol monobutyl ether: Not Applicable
- Methoxy triglycol: Not Applicable

Administration Act of hazardous chemicals regulation:

The finished product information- Not Applicable

Information componentized - Not Applicable (Ethylene glycol, Ionized water, Sodium Benzoate)

C. Hazardous Safety Administration Act by regulation

- Diethylene glycol: Not Applicable
- Triethylene glycol monobutyl ether: Not Applicable
- Methoxy triglycol: Not Applicable
- Trade secrets: No Data

D. Waste Management Act by regulation: No data

E. Other internal and foreign acts

○ EU classification

– Category results confirmed:

Diethylene glycol: Xn ; R22

Triethylene glycol monobutyl ether: Xi ;R41

Methoxy triglycol: Xi

– Hazard Statement:

Diethylene glycol: R22

Triethylene glycol monobutyl ether: Xi ; R41

Methoxy triglycol: R38

– Phrases precautions:

Diethylene glycol: S2, S46

Triethylene glycol monobutyl ether: S2, S26, S39, S46

Methoxy triglycol: S2, S24, S46

○ U.S. acts

– OSHA regulation (29CFR1910.119): Not Applicable

– CERCLA 103 regulation (40CFR302.4): Not Applicable

– EPCRA 302 regulation (40CFR355.30): Not Applicable

– EPCRA 304 regulation (40CFR355.40): Not Applicable

– EPCRA 313 regulation (40CFR372.65): Not Applicable

– PIC substance: Not Applicable

– POPs substance: Not Applicable

16. Other Information

1) References

– Korea Occupational 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 Brake DOT 4		
Team	Date of first preparation	Date of last revision	Revision Number
Finished Lubricants R&D Team	2012-11-30	2017-10-26	3

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 - Recommended use : Automotive Brake System
 - Restrictions on use : No data

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- Signal word : Warning
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 - H361 Suspected of damaging fertility or the unborn child
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 - P201 Obtain special instructions before use.
 - P202 Do not handle until all safety precautions have been read and understood.

- P280 Wear protective gloves/protective clothing/eye protection/face protection.
- Response
P308+P313 IF exposed or concerned: Get medical advice/attention.
- Storage
P405 Store locked up.
- Disposal
P501 Dispose of contents/container to ...

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Component	NFPA	Health	Fire	Reactivity
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 - Wash affected eyes for at least 15 minutes under running water with eyelids held open.
- 2) Skin contact :
 - Wash thoroughly with soap and water.
- 3) Inhalation :
 - Move to fresh air.
- 4) Ingestion :
 - Rinse mouth immediately and then drink plenty of water, seek medical attention.
- 5) Most important symptoms/effects, acute and delayed :

– Consider the supply of oxygen.

6) First-aid treatment and information on medical doctors :

– Treat symptomatically.

Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.

5. Fire Fighting Measures

1) Recommended(or prohibited) extinguishing media

○ Recommended extinguishing media :

– Dry extinguishing media, carbon dioxide, water spray, AFFF foam, alcohol-resistant foam

○ Prohibited extinguishing media :

– High pressure water shoot

○ Large fire :

– No Data. Water spray, alcohol-resistant foam

2) Specific hazard from chemical material

○ Thermal decomposition generate substances:

– Diethylene glycol: Carbon compounds

– Triethylene glycol monobutyl ether: Carbon compounds

– Methoxy triglycol: Carbon compounds

○ An explosion and fire risk :

– Ethylene glycol: A slight risk of fire

– Sodium Benzoate: A slight risk of fire

– Ionized water: A slight risk of fire

3) Special protective equipment.

If you can do without the risk of fire, the courage to move from the area.

Spray some substance to the pressurized water leakage, preventing them from scattering.

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1) Necessary actions to protect human health :

– Eliminate all sources of ignition, adequate ventilation,

2) Necessary actions to protect the environment

– Do not abandon your product to rivers.

3) Purification and removal methods

– After absorbing material to absorb using the disposal, burning

7. Handling and Storage

1) Safety handling :

– Eyes, skin, clothes and to avoid contact

2) Storage :

– Store in a cool , dry place.

8. Exposure Control and Personal Protection

A. Exposure limits and biological exposure limits of chemical

1) Diethylene glycol

- Domestic Policy : Not Applicable
- ACGIH : No data
- Biological exposure limits : No data

2) Triethyleneglycol monobutyl ether

- Domestic Policy : Not Applicable
- ACGIH : No data
- Biological exposure limits : No data

3) Methoxy triglycol

- Domestic Policy : Not Applicable
- ACGIH : Not applicable
- Biological exposure limits : Not applicable

4) Trade secrets

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

B. Engineering management :

Ventilation: local exhaust ventilation system, install and maintain appropriate control over the wind speed to make it.

C. Personal protection equipment :

- Respiratory protection :
A mask poison prevention
- Eyes protection :
Safety glasses with side-shields(frame goggles)
- Hands protection :
Chemical resistance protective gloves
- Human body protection :
Wearing of closed work clothing is recommended.

9. Physical and Chemical Properties

1) Appearance : Amber liquid

2) Odor : No data

3) Odor threshold : No data

4) pH : 9~10

5) Melting point/freezing point : No data

6) Initial boiling point or boiling range : >230°C

- 7) Flash point : >140°C
- 8) Evaporation rate (BuAc=1) : No data
- 9) Flammability(solid, gas) : No data
- 10) Upper/lower flammability or explosive limits(LEL / UEL): 15 / 3 vol%
- 11) Vapor pressure : < 1 mbar (20°C)
- 12) Solubility : soluble
- 13) Vapor density : >1
- 14) Relative density : 1.070 g/ ml (20°C)
- 15) Partition coeficient: n-octano/water : No data
- 16) Auto-ignition temperature : >200°C
- 17) Decomposition temperature : No data
- 18) Viscosity : 12 ~ 16 mm²/s (20°C)
- 19) Molecular weight : No data

10. Stability and Reactivity

- 1) Chemical stability :
 - stable at room temperature.
- 2) Toxicant generation possibility during reaction :
 - No hazardous reactions when stored and handled according to instructions.
- 3) Prohibited conditions :
 - heat, lights, fire works
- 4) Prohibited materials :
 - Oxidizers
- 5) When hazardous substances produced by decomposition: carbon oxides

11. Toxicological Information

A. Information on the likely routes of exposure

- Inhalation :
 - Diethylene glycol: Headache, sleepiness, dizziness
- Ingestion :
 - Diethylene glycol: Hypothermia, fever, blood pressure changes, vomiting, diarrhea, sleepiness,

chest pain, shortness of breath, headache, dizziness, cramping, lethargy

Triethylene glycol monobutyl ether: Kidney pain

Skin contact :

Diethylene glycol: Stimulus, absorbing

Triethylene glycol monobutyl ether: Stimulus

Eye contact :

Diethylene glycol: Stimulus

Triethylene glycol monobutyl ether: Stimulus

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

Acute Toxicity

– Oral :

Diethylene glycol: LD50 12,565mg/kg(rat)

Triethylene glycol monobutyl ether: LD50 5,300mg/kg(rat)

Methoxy triglycol: LD50 11,300 µg/kg(rat)

– Dermal :

Diethylene glycol: LD50 11,890mg/kg(rabbit)

Triethylene glycol monobutyl ether: LD50 2,000mg/kg(rabbit)

Methoxy triglycol: LD50 7,100 µg/kg(rat)

– Inhalation :

Diethylene glycol: No data

Triethylene glycol monobutyl ether: No data

Methoxy triglycol: No data

Skin Corrosion / irritation : No data

Severe eye Damage/irritation : No data

Respiratory sensitization : No data

Skin sensitization : No data

Carcinogenicity : No data

Germ cell mutagenity : No data

Reproductive Toxicity :

Diethylene glycol: No data

Triethylene glycol monobutyl ether: No data

Methoxy triglycol: Toxic to Reproduction Category 2

Specific target organ Toxicity(single exposure) : No data

Specific target organ Toxicity(repeated exposure) : No data

Aspiration toxicity : No data

12. Ecological Information

A. Aquatic, terrestrial organisms toxicity : No data

Diethylene glycol: Fish: LC50 3,200mg/L/96h

B. Persistence and degradability :

– Triethylene glycol monobutyl ether: BOD5/COD = 0.16

C. Bioaccumulative potential

– No data

D. Mobility in soil :

– No data

- E. Other adverse effects :
– No data

13. Disposal Considerations

- 1) Disposal methods :
Obsolete applied in accordance with regulations.
- 2) Disposal cautions :
Not Applicable

14. Transport Information

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

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

15. Regulatory Information

- A. Industrial safety and health act (Korea)
Not determined
- B. Chemical control act (Korea)
Not determined
- C. Dangerous Goods Safe Control Act (Korea)
Category 4 Dangerous Goods (Flammable Liquids), Grade 4 petroleum chemicals
- D. Wastes control act (Korea)
No data
- E. Other internal and foreign acts
- EU classification
 - Category results confirmed:
 - Diethylene glycol: Xn ; R22
 - Triethylene glycol monobutyl ether: Xi ;R41
 - Methoxy triglycol: Xi
 - Hazard Statement:
 - Diethylene glycol: R22
 - Triethylene glycol monobutyl ether: Xi ; R41

Methoxy triglycol: R38

– Phrases precautions:

Diethylene glycol: S2, S46

Triethylene glycol monobutyl ether: S2, S26, S39, S46

Methoxy triglycol: S2, S24, S46

○ U.S. acts

- OSHA regulation (29CFR1910.119): Not Applicable
- CERCLA 103 regulation (40CFR302.4): Not Applicable
- EPCRA 302 regulation (40CFR355.30): Not Applicable
- EPCRA 304 regulation (40CFR355.40): Not Applicable
- EPCRA 313 regulation (40CFR372.65): Not Applicable
- PIC substance: Not Applicable
- POPs substance: Not Applicable

16. Other Information

1) References

- Korea Occupational 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

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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.