

# Material Safety Data Sheet (MSDS)

## 1. Chemical Product & Company Identification

**A. Product Name** : S-OIL Brake Fluid DOT-3

○ Part Numbers :

**B. Intended Use**

: Brake Fluid of automobiles

**C. Manufacturer & Supplier information**

○ Manufacturer : Kukdong Jeyen Co., Ltd (☎ +82-31-680-0505 Fax. +82-31-680-0507)

○ Address : #1173-4 Wonjeong-ri Poseung-eup Pyeongtaek-si Gyeonggi-do Korea Rep.

○ Supplier : S-OIL CORPORATION CO.,LTD,

○ Address : 192, Baekbeom-ro, Mapo-gu, Seoul 04196, Korea

## 2. Hazard Identification

**A. Hazard Identification**

**1) Physicochemical** : Not Classified

**2) Health hazards** :

Acute toxicity (Inhalation: Dust/Mist) : Category 4

Serious eye damage/ eye irritation : Category 2

Toxic to Reproduction : Category 2

Specific target organ toxicity following repeat exposure : Category 1

**3) Environmental hazards** : Not Classified

**B. Precautionary Statement(s) & Warning Label**

1) Symbols



2) Signal Word : Caution

3) Hazard Statement(s)

H319 - Causes serious eye irritation.

H332 - Harmful if inhaled.

H361 - Suspected of damaging fertility or the unborn child

H372 - Causes damage to organs through prolonged or repeated exposure

4) Precautionary Statement(s)

■ Precautionary

P201 : Obtain special instructions before use.

P202 : Do not handle until all safety precautions have been read and understood.

P260 : Do not breathe dust/fume/gas/mist/vapours/spray.

P261 : Avoid breathing dust/fume/gas/mist/vapours/spray.

P264 : Wash ... thoroughly after handling.

P270 : Do not eat, drink or smoke when using this product.

P271 : Use only outdoors or in a well-ventilated area.

P280 : Wear protective gloves/protective clothing/eye protection/face protection.

■ Response

P304+P340 : IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P305+P351+P338 : IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P308+P313 : IF exposed or concerned: Get medical advice/attention.

P312 : Call a POISON CENTER or doctor/physician if you feel unwell.

P314 : Get medical advice/attention if you feel unwell.

P337+P313 : If eye irritation persists: Get medical advice/attention.

■ Storage

P405 : Store locked up.

■ Disposal

P501 : Dispose of contents and container in accordance with applicable regulations.

**C. Other hazards.**

Chemicals Name	NFPA Ratings		
	Health	Fire	Reactivity
1. Poly ethylene glycol Mono Methylether	0	1	0
2. Methoxy tri glycol	0	1	0
3. Tri ethylene glycol monobutyl ether	2	1	0
4. Diethylene Glycol	1	1	0
5. BUSINESS SECRET(S1)	2	1	3

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### 3. Composition / Information on ingredients

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Chemical Name	Other name	CAS No.	%
1. Poly ethylene glycol Mono Methylether	Methoxy poly(ethylene glycol)	9004-74-4	10 ~ 20 %
2. Methoxy tri glycol	(2-(2-(2-Methoxy) Ethoxy)-Ethanol)	112-35-6	15 ~ 25 %
3. Tri ethylene glycol monobutyl ether	TRIGLYCOL MONOBUTYL ETHER	143-22-6	35 ~ 45 %
4. Diethylene Glycol	Oxy-bis Ethanol	111-46-6	20 ~ 30 %
5. BUSINESS SECRET (S1)	-	-	MAX 1%

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### 4. First aid Measures

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**A. Eye Contact :**

Move to fresh air. Flush thoroughly with water at least 15 minutes.

Get medical assistance.

**B. Skin contact :**

Wash contact areas with soap and water.

Remove contaminated clothing and shoes.

Get medical aid if irritation develops and persists.

Wash clothing before reuse.

**C. Inhalation :**

If inhaled, remove to fresh air.

If not breathing give artificial respiration.

Get medical aid.

**D. Ingestion :**

Potential for aspiration if swallowed.

Get medical aid immediately.

Do not induce vomiting unless directed to do so by medical personnel.

Never give anything by mouth to an unconscious person.

If vomiting occurs naturally, have victim lean forward.

**E. Likely Acute or Delayed symptoms/Effects :**

1) Inhalation

Short term exposure : Irritation, Sleepinss, Headache, Dizziness, Blood disorder.

Long term exposure : Irritation, Headache.

2) Skin contact

Short term exposure : Vomiting, Gastraigia, Headache, Dizziness, Sleepinss, Hallucination, Convulsions, Coma,  
Allergic reaction.

Long term exposure : Irritation, Allergic reaction

3) Eye contact

Short term exposure : Irritation

Long term exposure : No data available

4) Ingestion

Short term exposure : Vomiting, Gastraigia, Headache, Dizziness, Sleepinss, Hallucination, Convulsions, Coma.

Long term exposure : Kidney trouble

**F. Emergency measure / notes to physician**

: No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient

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## 5. Fire Fighting Measures

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**A. Extinguishing media :**

1) Suitable extinguishing media

: Fog, foam, dry Chemical powder

2) Unsuitable extinguishing media

: No data available

3) Unusual fire (Big fire)

: Do use extinguishing media with Water fog.

**B. Unusual fire & Explosion hazard :**

1) Hazardous combustion product : CO (carbon monoxide), CO<sub>2</sub> (carbon dioxide)

2) Fire & Explosion hazard : Slightly flammable to flammable in presence of open flames and sparks, of heat.

Non-flammable in presence of shocks.

**C. Special fire fighting procedure / protection of firefighters :**

Wear self-contained breathing apparatus for firefighting if necessary.

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## 6. Accidental Release Measure

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**A. Personal precautions :**

Shut off all sources of ignition.

Wear self-contained breathing apparatus.

**B. Environmental precautions :**

1) Atmosphere release : No data available

2) Soil release : No data available

3) Underwater release : No data available

**C. Spill cleanup methods**

1) Small liquid spill : Use a non-combustible material like sand to soak up the product and place into a container for later disposal.

2) Large spillages : No data available

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## 7. Handling and Storage

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**A. Handling**

Keep away from heat.

Keep away from sources of ignition.

Empty containers pose a fire risk.

Evaporate the residue under a fume hood.

Ground all equipment containing material.

Do not ingest.

Do not breathe gas/fumes/vapor/spray.

Wear suitable protective clothing.

If ingested, seek medical advice.

Immediately and show the container or the label.

Keep away from incompatibles such as oxidizing agents, acids, alkalis.

**B. Storage**

Keep container tightly closed.

Keep container in a cool.

Well-ventilated area.

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## 8. Exposure Controls / Personal Protection

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**A. Exposure limit value :**

**1) Poly ethylene glycol Mono Methylether**

Korea : TWA : No data available

STEL : No data available

ACGIH : VTL-TWA : No data available

VTL-STEL : No data available

OSHA : No data available

**2) Methoxy tri glycol**

Korea : TWA : No data available

STEL : No data available

ACGIH : VTL-TWA : No data available

VTL-STEL : No data available

OSHA : No data available

**3) Tri ethylene glycol monobutyl ether**

- Korea : TWA : No data available  
STEL : No data available
- ACGIH : VTL-TWA : No data available  
VTL-STEL : No data available
- OSHA : No data avail

#### 4) Diethylene Glycol

- Korea : TWA : No data available  
STEL : No data available
- ACGIH : VTL-TWA : No data available  
VTL-STEL : No data available
- OSHA : No data avail

#### 5) BUSINESS SECRET (S1)

- Korea : TWA : No data available  
STEL : No data available
- ACGIH : VTL-TWA : No data available  
VTL-STEL : No data available
- OSHA : No data avail

#### B. Engineering Control :

Adequate ventilation (localize ventilation) should be provided in workplaces.

Use non sparking tools.

#### C. Personal protective equipment

##### 1) Respiratory protection

Prevent inhalation of the solvents.

If required to control exposure, use only suitable respirators and components tested and approved under appropriate government standards such as NIOSH.

##### 2) Eye protection

Wear approved chemical safety glasses or goggles where eye exposure is reasonably probable.

Eye wash fountain is recommended.

##### 3) Hand protection

Wear protective gloves.

Butyl rubber gloves are recommended.

##### 4) Skin / Body protection

Wear protective cloths.

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## 9. Physical and Chemical properties

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**A. Appearance** : Physical state - liquid, Color - Yellow

**B. Odor** : Mild, Ether

**C. Odor Threshold** : No data available

**D. pH** : 8.0 ~ 9.5

**E. Melting Point / Freezing Point** : No data available

**F. Boiling Point / range** : More than 240 °C

**G. Flash Point** : More than 125 °C

**H. Evaporation rate** : No data available

**I. Flammability Limit (Lower/Upper)** : 3.0% / 15%

**J. Vapor pressure** : 0.1 mmHg (20 °C)

**K. Solubility in water** : Soluble

**L. Vapor density (Air=1)** : 4

**M. Specific Gravity** : 1.040 ~ 1.060

**N. Partition Coefficient** (n-Octanol/Water) : No data available

**O. Auto-ignition temperature** : 200 °C

**P. Thermal decomposition** : No data available

**Q. Viscosity** : 1300 cst (-40 °C)

**R. Molecular weight** : Not Applicable / Mixture

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## 10. Stability and Reactivity

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**A. Stability** : Stable under normal temperatures and pressures.

**B. Possibility of hazardous reaction** : Has not been reported.

**C. Condition to avoid** : Ignition source.

Excess heat, flame.

**D. Incompatible material** : Oxidizing agents, acid, alkalis.

**E. Hazardous decomposition products** : Hydrocarbon compounds.

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## 11. Toxicological Information

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### A. Route of exposure

- 1) Inhalation : No data available
- 2) Ingestion : No data available
- 3) Skin contact : No data available
- 4) Eye contact : No data available

### B. Delayed, Immediate, and Chronic effects of Short-and Long-term Exposure

#### 1) Poly ethylene glycol Mono Methylether

- Acute toxicity
  - Oral : LD50 22,000mg/kg Rat
  - Skin : LD50 20,000mg/kg Rabbit
  - Inhalation : No data available
- Skin contact : Rabbit/Skin(500mg): slight irritation (OPEN DRAIZE TEST)
- Eye contact or Irritation : Irritation to eyes
- Sensitization : No data available
- Carcinogenicity :
  - KOSHA : Not listed
  - OSHA : Not listed
  - NTP : Not listed
  - IARC (GROUP) : Not listed
  - ACGIH : Not listed
  - EC: Not listed
- Mutagenesis : No data available
- Reproductive toxicity : No data available
- Specified target organ general toxicity - single exposure : irritation in the airway when inhale
- Specified target organ general toxicity - repetitive exposure : No data available
- Aspiration respiratory organs hazard : No data available

#### 2) Methoxy tri glycol

- Acute toxicity
  - Oral : LD50 3980mg/kg Rat

Skin : LD50 7400mg/kg Rabbit

Inhalation : No data available

- Skin contact : Human - Slight irritation
- Eye contact or Irritation : Rabbit - Slight irritation
- Sensitization : No data available
- Carcinogenicity :
  - KOSHA : Not listed
  - OSHA : Not listed
  - NTP : Not listed
  - IARC (GROUP) : Not listed
  - ACGIH : Not listed
  - EC: Not listed
- Mutagenesis : Invitro / Negative
- Reproductive toxicity : rat / patrilineal / matrilineal influence
- Specified target organ general toxicity - single exposure : No data available
- Specified target organ general toxicity - repetitive exposure : No data available
- Aspiration respiratory organs hazard : No data available

### 3) Tri Ethylene glycol Mono Butylether

- Acute toxicity
  - Oral : LD50 5300mg/kg Rat
  - Skin : LD50 2000mg/kg Rabbit
  - Inhalation : No data available
- Skin contact : Slight irritation (10mg, 24hr, Rabbit)
- Eye contact or Irritation : Normal irritation (20mg, 24hr, Rabbit)
- Sensitization : No data available
- Carcinogenicity :
  - KOSHA : Not listed
  - OSHA : Not listed
  - NTP : Not listed
  - IARC (GROUP) : Not listed
  - ACGIH : Not listed
  - EC: Not listed
- Mutagenesis : No data available
- Reproductive toxicity : No data available
- Specified target organ general toxicity - single exposure : No data available
- Specified target organ general toxicity - repetitive exposure : No data available
- Aspiration respiratory organs hazard : No data available

### 4) Diethylene Glycol

- Acute toxicity
  - Oral : LD50 12,565mg/kg Rat
  - Skin : LD50 11,890mg/kg Rabbit
  - Inhalation : No data available
- Skin contact : Slight irritation (500mg, Rabbit)
- Eye contact or Irritation : Slight irritation (50mg, Rabbit)
- Sensitization : No data available
- Carcinogenicity :
  - KOSHA : Not listed
  - OSHA : Not listed
  - NTP : Not listed

IARC (GROUP) : Not listed

ACGIH : Not listed

EC : Not listed

- Mutagenesis : No data available
- Reproductive toxicity : No data available
- Specified target organ general toxicity - single exposure : No data available
- Specified target organ general toxicity - repetitive exposure : No data available
- Aspiration respiratory organs hazard : No data available

#### 5) BUSINESS SECRET (S1)

- Acute toxicity
  - Oral : LD50 560mg/kg Rat
  - Skin : LD50 >1000mg/kg Rabbit
  - Inhalation : Dust LC50 1.43mg/kg 4hr Rat
- Skin contact : Slight irritation
- Eye contact or Irritation : Slight irritation(rabbit)
- Sensitization : No data available
- Carcinogenicity :
  - KOSHA : Not listed
  - OSHA : Not listed
  - NTP : Not listed
  - IARC (GROUP) : Not listed
  - ACGIH : Not listed
  - EC: Not listed
- Mutagenesis : No data available
- Reproductive toxicity : No data available
- Specified target organ general toxicity - single exposure : irritation in the airway when inhale
- Specified target organ general toxicity - repetitive exposure : No data available
- Aspiration respiratory organs hazard : No data available

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## 12. Ecological Information

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### A. Ecotoxicity

#### 1) Poly ethylene glycol Mono Methylether

- Fishes : No data available
- Crustacea : No data available
- Seaweeds : No data available

#### 2) Methoxy tri glycol

- Fishes : LC50 MIN 10000mg/l 96hr Leuciscus idus
- Crustacea : LC50 MIN 10000mg/l 96hr Leuciscus idus
- Seaweeds : ErC50 MIN 500mg/l 72hr Scenedesmus subspicatus

#### 3) Tri Ethylene glycol Mono Buthylether

- Fishes : No data available
- Crustacea : No data available
- Seaweeds : No data available

#### 4) Diethylene Glycol

- Fishes : No data available
- Crustacea : No data available
- Seaweeds : No data available



**5) BUSINESS SECRET (S1)**

- Fishes : No data available
- Crustacea : No data available
- Seaweeds : No data available

**B. Persistence and Degradability**

**1) Poly ethylene glycol Mono Methylether**

- Persistence : log Kow -2
- Degradability : No data available

**2) Methoxy tri glycol**

- Persistence : log Kow -1.46
- Degradability : No data available

**3) Tri Ethylene glycol Mono Buthylether**

- Persistence : No data available
- Degradability : BOD5/COD 0.16

**4) Diethylene Glycol**

- Persistence : No data available
- Degradability : No data available

**5) BUSINESS SECRET (S1)**

- Persistence : log Kow 1.44
- Degradability : No data available

**C. Bio accumulation**

**1) Poly ethylene glycol Mono Methylether**

- Accumulation : BCF 3.162

**2) Methoxy tri glycol**

- Accumulation : BCF 0.046

**3) Tri Ethylene glycol Mono Buthylether**

- Accumulation : No data available

**4) Diethylene Glycol**

- Accumulation : BCF 100 ((Leuciscus idus melanotus(Fish, fresh water), 0.05mg/l))

**5) BUSINESS SECRET (S1)**

- Accumulation : BCF 2.5

**D. Ozone layer hazard** : Not applicable

**E. Mobility in Soil** : No data available

**F. Other Information** : No data available

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## 13. Disposal Consideration

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**A. Disposal method** : Dispose in accordance with all applicable regulations.

**B. Disposal instruction** : No data available

**C. Waste code** : No data available

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## 14. Transportation Information

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**14.1 UN number**

ADR/RID: -

IMDG: -

IATA: -

**14.2 UN proper shipping name**

ADR/RID : Not regulated as dangerous goods

IMDG : Not regulated as dangerous goods

IATA : Not regulated as dangerous goods

#### 14.3. Transport hazard class(es)

ADR/RID: -

IMDG: -

IATA: -

#### 14.4. Packing group

ADR/RID: -

IMDG: -

IATA: -

#### 14.5. Environmental hazards

ADR/RID: -

IMDG: -

IATA: -

#### 14.6. Special precautions for user

No data available

#### 14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

No data available

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## 15. Regulatory Information

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### A. Regulation

#### 1) Poly ethylene glycol Mono Methylether

**E.U** : Hazard symbols : No

Risk phrases : No

Safety phrases : No

#### **U.S**

OSHA regulation (29 CFR1910.119) : No

CERCLA 103 regulation(40 CFR 302.4) : No

EPCRA 302 regulation(40 CFR355.30) : No

EPCRA 304 regulation(40 CFR355.40) : No

EPCRA 313 regulation(40 CFR372.65) : No

US. Toxic Substances Control Act : Listed

CEPA - Domestic Substances List (DSL) : Listed

#### 2) Methoxy tri glycol

**E.U** : Hazard symbols : No

Risk phrases : No

Safety phrases : No

#### **U.S**

OSHA regulation (29 CFR1910.119) : No

CERCLA 103 regulation(40 CFR 302.4) : No

EPCRA 302 regulation(40 CFR355.30) : No

EPCRA 304 regulation(40 CFR355.40) : No

EPCRA 313 regulation(40 CFR372.65) : No

US. Toxic Substances Control Act : Listed

CEPA - Domestic Substances List (DSL) : Listed

#### 3) Tri Ethylene glycol Mono Butylether

**E.U** : Hazard symbols : Xi: R41

Risk phrases : R41

Safety phrases : S2, S26, S39, S46

#### **U.S**

OSHA regulation (29 CFR1910.119) : No

CERCLA 103 regulation(40 CFR 302.4) : No

EPCRA 302 regulation(40 CFR355.30) : No

EPCRA 304 regulation(40 CFR355.40) : No  
EPCRA 313 regulation(40 CFR372.65) : No  
US. Toxic Substances Control Act : Listed  
CEPA - Domestic Substances List (DSL) : Listed

#### 4) Diethylene Glycol

**E.U** : Hazard symbols : Xn: R22

Risk phrases : R22

Safety phrases : S2, S46

#### **U.S**

OSHA regulation (29 CFR1910.119) : No  
CERCLA 103 regulation(40 CFR 302.4) : No  
EPCRA 302 regulation(40 CFR355.30) : No  
EPCRA 304 regulation(40 CFR355.40) : No  
EPCRA 313 regulation(40 CFR372.65) : No  
US. Toxic Substances Control Act : Listed  
CEPA - Domestic Substances List (DSL) : Listed

#### 5) BUSINESS SECRET (S1)

**E.U** : Hazard symbols : No

Risk phrases : No

Safety phrases : No

#### **U.S**

OSHA regulation (29 CFR1910.119) : No  
CERCLA 103 regulation(40 CFR 302.4) : No  
EPCRA 302 regulation(40 CFR355.30) : No  
EPCRA 304 regulation(40 CFR355.40) : No  
EPCRA 313 regulation(40 CFR372.65) : No  
US. Toxic Substances Control Act : Listed  
CEPA - Domestic Substances List (DSL) : Listed

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## 16. Other Information

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The information presented herein is believed to be factual as it has been derived from the works from the works and opinions of persons believed to be qualified experts; however, nothing contained in this information is to be taken as a warrant or representation for which **KUKDONG JEYEN Co., LTD.** Bears legal responsibility. The user should review any recommendation in the specific context of the intended use to determine whether they are appropriate.

#### **A. Issue date :**

2013. 04. 01

#### **B. Last revision :**

2017. 04. 10 (Rev. 3) - Accordance with GHS regulation