

**2-Mercaptoethanol (BME)**

Version 3.0

Revision Date 2023-11-27

MSDS number: AA00974-0000000427

SECTION 1: Identification of the substance/mixture and of the company/undertaking

Product Name : 2-Mercaptoethanol (BME)
Material : 1122450, 1122449, 1017944, 1068852, 1088828, 1086429,
1104362, 1093708, 1086428, 1021562, 1024822, 1021565,
1024821, 1021564, 1028369, 1033065, 1028386, 1028385,
1033120

Recommended use of the product : Chemical intermediate
Restrictions on use : None known.

Address : Chevron Phillips Chemical Company LP
10001 Six Pines Drive
The Woodlands, TX 77380

Address : CHEVRON PHILLIPS CHEMICALS ASIA PTE. LTD.
C/O DONG WOO CORPORATION
#B-2601, JEONGJAIL-RO,
BUNDANG-GU, SEONGNAMI-SI,
GYEONGGI-DO, 13557
SOUTH KOREA
Telephone no.: +612-9186-1132

Emergency telephone:**Health:**

866.442.9628 (North America)
1.832.813.4984 (International)

Transport:

CHEMTREC 800.424.9300 or 703.527.3887(int'l)
Asia: CHEMWATCH (+612 9186 1132) China: 0532 8388 9090
Mexico CHEMTREC 01-800-681-9531 (24 hours)
South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600
Argentina: +(54)-1159839431
EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

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Austria: VIZ +43 1 406 43 43 (24 hours/day, 7 days/week)
 Belgium: 070 245 245 (24 hours/day, 7 days/week)
 Bulgaria: +359 2 9154 233
 Croatia: +3851 2348 342 (24 hours/day, 7 days/week)
 Cyprus: 1401
 Czech Republic: Toxicological Information Center +420 224 919 293, +420 224 915 402
 Denmark: Danish Poison Center (Gifflinjen): +45 8212 1212
 Estonia: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
 Finland: 0800 147 111 09 471 977 (24 hours/day)
 France: ORFILA number (INRS): + 33 (0) 1 45 42 59 59 (24 hours/day, 7 days/week)
 Germany: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
 Greece: (0030) 2107793777 (24 hours/day, 7 days/week)
 Hungary: +36-80-201-199 (24 hours/day, 7 days/week)
 Iceland: 543 2222 (24 hours/day, 7 days/week)
 Ireland: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
 Italy: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
 Latvia: State Fire and Rescue Service, phone number: 112; Toxicology and Sepsis Clinic
 Poisoning and Drug Information Center, Hipokrāta 2, Riga, Latvia, LV-1038, phone number +371
 67042473. (24 hours.)
 Liechtenstein: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
 Lithuania: +370 (85) 2362052
 Luxembourg: (+352) 8002 5500 (24 hours/day, 7 days/week)
 Malta: +356 2395 2000
 The Netherlands: NVIC: +31 (0)88 755 8000
 Norway: 22 59 13 00 (24 hours/day, 7 days/week)
 Poland: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
 Portugal: CIAV phone number: +351 800 250 250
 Romania: +40213183606
 Slovakia: +421 2 5477 4166
 Slovenia: Phone number: 112
 Spain: National Emergency Telephone Number of Spanish Poison Centre: +34 91 562 04 20 (24
 hours/day, 7 days/week)
 Sweden: 112 – ask for Poisons Information

Responsible Department : Product Safety and Toxicology Group
 E-mail address : SDS@CPChem.com
 Website : www.CPChem.com
 Appointees : 회사명: 리이치24시코리아(주).
 주소: 서울특별시 강남구 강남대로 94길 34,4층
 전화: + 82-02-6245-1610

SECTION 2: Hazards identification**Hazard classification**

Standards for classification and labeling of chemical substances and material safety data sheet
(ministry of employment and labor public notice No. 2023-9)

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Classification

: Acute toxicity, Category 3, Oral
 Acute toxicity, Category 3, Inhalation
 Acute toxicity, Category 2, Dermal
 Skin corrosion/irritation, Category 2
 Serious eye damage/eye irritation, Category 1
 Skin sensitization, Category 1
 Reproductive toxicity, Category 2
 Specific target organ toxicity - repeated exposure, Category 2,
 Heart, Liver
 Aspiration hazard, Category 2
 Short-term (acute) aquatic hazard, Category 1
 Long-term (chronic) aquatic hazard, Category 2

Warning label elements including precautionary statements

Symbol(s)

:



Signal Word

: Danger

Hazard Statements

: H301: Toxic if swallowed.
 H305: May be harmful if swallowed and enters airways.
 H310: Fatal in contact with skin.
 H315: Causes skin irritation.
 H317: May cause an allergic skin reaction.
 H318: Causes serious eye damage.
 H331: Toxic if inhaled.
 H361: Suspected of damaging fertility or the unborn child.
 H373: May cause damage to organs (Heart, Liver) through prolonged or repeated exposure.
 H400: Very toxic to aquatic life.
 H411: Toxic to aquatic life with long lasting effects.

Precautionary Statements

: **Prevention:**
 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/ vapors/ spray.
 P262: Do not get in eyes, on skin, or on clothing.
 P264: Wash the contact area thoroughly after handling.
 P270: Do not eat, drink or smoke when using this product.
 P271: Use only outdoors or in a well-ventilated area.
 P272: Contaminated work clothing should not be allowed out of the workplace.
 P273: Avoid release to the environment.
 P280: Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response:
 P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician.

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P301 + P310 + P330: IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician. Rinse mouth.

P302 + P352 + P310: IF ON SKIN: Wash with plenty of water. Immediately call a POISON CENTER/ doctor.

P304 + P340 + P311: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/ physician.

P305 + P351 + P338 + P310: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/ physician.

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

P321: Specific treatment (see supplemental first aid instructions on this label).

P331: Do NOT induce vomiting.

P361 + P364: Take off immediately all contaminated clothing and wash it before reuse.

P391: Collect spillage.

Storage:
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Disposal:
P501: Dispose of contents and container according to wastes control act.

Other hazards which do not result in classification : None

SECTION 3: Composition/information on ingredients

Synonyms : beta-Mercaptoethanol
BME
Thioglycol
2, Mercaptoethanol
2-Hydroxyethyl Mercaptan
2-Mercaptoethanol Pure

Molecular formula : HSCH₂CH₂OH

Common name	Synonyms	CAS-No.	Concentration	KECI Number
2-Mercaptoethanol	2-mercaptoethanol	60-24-2	99 % - 100%	KE-23095

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SECTION 4: First aid measures

- General advice : Move out of dangerous area. Consult a physician. Show this material safety data sheet to the doctor in attendance. Material may produce a serious, potentially fatal pneumonia if swallowed or vomited.
- In case of eye contact : Small amounts splashed into eyes can cause irreversible tissue damage and blindness. In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Continue rinsing eyes during transport to hospital. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.
- In case of skin contact : Take victim immediately to hospital. If on skin, rinse well with water. If on clothes, remove clothes.
- If inhaled : If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician.
- If swallowed : Keep respiratory tract clear. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician. Take victim immediately to hospital.

Other cautions for Doctors

- Symptoms : No data available.
- Risks : No data available.
- Treatment : No data available.

SECTION 5: Firefighting measures

- Flash point : 68.3°C (154.9°F)
Method: Tag closed cup
- Autoignition temperature : 295°C (563°F)
estimated
- Suitable extinguishing media : Carbon dioxide (CO₂).
- Unsuitable extinguishing media : High volume water jet.
- Specific hazards during fire fighting : Do not allow run-off from fire fighting to enter drains or water courses.

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- Special protective equipment for fire-fighters : Wear self-contained breathing apparatus for firefighting if necessary.
- Further information : Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. For safety reasons in case of fire, cans should be stored separately in closed containments. Use a water spray to cool fully closed containers.
- Fire and explosion protection : Do not spray on a naked flame or any incandescent material. Keep away from open flames, hot surfaces and sources of ignition.

SECTION 6: Accidental release measures

- Personal precautions : Use personal protective equipment. Ensure adequate ventilation.
- Environmental precautions : Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.
- Methods for cleaning up : Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). Keep in suitable, closed containers for disposal.

SECTION 7: Handling and storage**Handling**

- Advice on safe handling : Avoid formation of aerosol. Do not breathe vapors/dust. Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Provide sufficient air exchange and/or exhaust in work rooms. To avoid spills during handling keep bottle on a metal tray. Dispose of rinse water in accordance with local and national regulations. Persons susceptible to skin sensitization problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.
- Advice on protection against fire and explosion : Do not spray on a naked flame or any incandescent material. Keep away from open flames, hot surfaces and sources of ignition.

Secure storage

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Requirements for storage areas and containers	:	Prevent unauthorized access. No smoking. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.
Uses advised against	:	None known.
Specific Use	:	Chemical intermediate

SECTION 8: Exposure controls/personal protection**Chemical exposure standards, biological exposure standards, etc.**

Adequate ventilation to control airborne concentrations below the exposure guidelines/limits. Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

Personal protective equipment

Respiratory protection	:	If ventilation or other engineering controls are not adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure, a supplied-air NIOSH approved respirator may be appropriate. If exposure to harmful levels of airborne material may occur, a NIOSH approved respirator that provides protection may be appropriate, such as:. A positive pressure, air-supplying respirator may be appropriate if there is potential for uncontrolled release, aerosolization, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.
Eye protection	:	Eye wash bottle with pure water.
Hand protection	:	The suitability for a specific workplace should be discussed with the producers of the protective gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.
Skin and body protection	:	Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place. Wear as appropriate:. Flame retardant protective clothing. Personal protection through wearing a tightly closed chemical protection suit and a self-contained

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breathing apparatus. Remove and wash contaminated clothing before re-use. Skin should be washed after contact. Complete head face and neck protection. Rubber apron. Footwear protecting against chemicals.

Hygiene measures : Avoid contact with skin, eyes and clothing. When using do not eat or drink. When using do not smoke. Wash hands before breaks and immediately after handling the product.

SECTION 9: Physical and chemical properties**Information on basic physical and chemical properties**

Appearance

Physical state	: liquid
Color	: Water white
Odor	: Repulsive
pH	: Not applicable
Pour point	: No data available
Freezing point	No data available
Boiling point/boiling range	: 155-160°C (311-320°F)
Flash point	: 68.3°C (154.9°F) Method: Tag closed cup
Evaporation rate	: 1
Lower explosion limit	: 2.3 %(V)
Upper explosion limit	: 18 %(V)
Vapor pressure	: 5.70 MMHG at 37.8°C (100.0°F)
Relative density	: 1.12 at 15.6 °C (60.1 °F)
Density	: 1,098 kg/m ³ at 40°C (104°F)
Vapor density	: 2.69 (Air = 1.0)
Partition coefficient: n-octanol/water	: Pow: 0.56
Autoignition temperature	: 295°C (563°F) estimated

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Viscosity, kinematic	: 1.5 cSt at 40°C (104°F)
Molecular weight	: No data available
Viscosity, dynamic	: 1.62 cP at 40°C (104°F)

SECTION 10: Stability and reactivity

Reactivity	: Stable under recommended storage conditions.
Chemical stability	: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Possibility of hazardous reactions	
Hazardous reactions	: Hazardous reactions: Hazardous polymerization does not occur. Hazardous reactions: Vapors may form explosive mixture with air.
Conditions to avoid	: Heat, flames and sparks.
Materials to avoid	: May react with oxygen and strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Other data	: No decomposition if stored and applied as directed.

SECTION 11: Toxicological information**Information on exposure routes****Acute oral toxicity**

2-Mercaptoethanol	: LD50: 98 - 168 mg/kg Species: Rat Sex: male and female Method: OECD Test Guideline 401
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Acute inhalation toxicity

2-Mercaptoethanol	: LC50: 625 ppm Exposure time: 4 h Test atmosphere: gas
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Acute dermal toxicity

2-Mercaptoethanol : LD50: ca. 112 - 224 mg/kg
Species: Rabbit
Sex: male and female

Skin corrosion or irritation

2-Mercaptoethanol : Skin irritation

Secure storage

2-Mercaptoethanol : Irreversible effects on the eye

Sensitization

2-Mercaptoethanol : The product is a skin sensitizer, sub-category 1A.

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Skin sensitization**

The product is a skin sensitizer, sub-category 1A.

Repeated dose toxicity

2-Mercaptoethanol : Species: Rat, Male and female
Sex: Male and female
Application Route: oral gavage
Dose: 0, 15, 50, 75 mg/kg
Exposure time: 7 wk
Number of exposures: daily
NOEL: 15 mg/kg
Lowest observable effect level: 50 mg/kg
Method: OECD Guideline 422
Target Organs: Heart, Liver

Germ cell mutagenicity (in vitro)

2-Mercaptoethanol : Test Type: Ames test
Method: Mutagenicity (Escherichia coli - reverse mutation assay)
Result: negative

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Test Type: Chromosome aberration test in vitro
 Method: OECD Guideline 473
 Result: negative

Test Type: Mouse lymphoma assay
 Method: OECD Guideline 476
 Result: negative

Test Type: Sister Chromatid Exchange Assay
 Result: Ambiguous

Germ cell mutagenicity (in vivo)

2-Mercaptoethanol : Test Type: Mouse micronucleus assay
 Method: Mutagenicity (micronucleus test)
 Result: negative

Developmental Toxicity

2-Mercaptoethanol : Species: Rat
 Application Route: oral gavage
 Dose: 5, 15, 25 mg/kg/bw/d
 Exposure time: GD 6-19
 Number of exposures: daily
 Test period: 20 d
 Method: OECD Guideline 414
 NOAEL Teratogenicity: 25 mg/kg
 NOAEL Maternal: 25 mg/kg
 Animal testing did not show any effects on fetal development.

Specific Target Organ Toxicity (Single Exposure)

No data available

Specific Target Organ Toxicity (Repeated Exposure)

No data available

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 ||Aspiration toxicity**

: May be harmful if swallowed and enters airways.

CMR effects

2-Mercaptoethanol : Carcinogenicity: Not available
 Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects.

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Teratogenicity: Animal testing did not show any effects on fetal development.
Reproductive toxicity: Some evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments.

Reproductive toxicity

2-Mercaptoethanol : Species: Rat
Sex: male
Application Route: oral gavage
Dose: 0, 15, 50, 75 mg/kg
Number of exposures: daily
Test period: 7 wks
Method: OECD Guideline 422
NOAEL Parent: 75 mg/kg

Species: Rat
Sex: female
Application Route: oral gavage
Dose: 0, 15, 50, 75 mg/kg
Number of exposures: daily
Test period: 7 wks
NOAEL Parent: 15 mg/kg

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Further information : Solvents may degrease the skin.

SECTION 12: Ecological information

Ecological Toxicity

Toxicity to fish

2-Mercaptoethanol : LC50: 37 mg/l
Exposure time: 96 h
Species: Leuciscus idus (Golden orfe)

Toxicity to daphnia and other aquatic invertebrates

2-Mercaptoethanol : EC50: 0.4 mg/l
Exposure time: 48 h
Species: Daphnia magna (Water flea)
Method: OECD Test Guideline 202

Toxicity to algae

2-Mercaptoethanol : EC50: 19 mg/l
Exposure time: 72 h
Species: Desmodesmus subspicatus (green algae)

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static test Method: OECD Test Guideline 201

M-Factor

2-mercaptoethanol : M-Factor (Acute Aquat. Tox.) 1

Toxicity to bacteria

2-Mercaptoethanol : EC50: 125 mg/l
 Exposure time: 17 h
 Growth rate
 Species: Pseudomonas putida

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)

2-Mercaptoethanol : NOEC: 0.0624 mg/l
 Exposure time: 21 d
 Species: Daphnia magna (Water flea)
 static renewal
 Method: OECD Test Guideline 211

Persistence and degradability

2-Mercaptoethanol : Result: Not readily biodegradable.
 < 10 %
 Method: OECD Test Guideline 301

Bioaccumulative

2-Mercaptoethanol : This material is not expected to bioaccumulate.

Mobility

2-Mercaptoethanol : No data available

Results of PBT assessment

2-Mercaptoethanol : Non-classified PBT substance, Non-classified vPvB substance

Other adverse effects : Very toxic to aquatic life., Toxic to aquatic life with long lasting effects.

Ecotoxicology Assessment**Short-term (acute) aquatic hazard**

2-Mercaptoethanol : Very toxic to aquatic life.

Long-term (chronic) aquatic hazard

2-Mercaptoethanol : Toxic to aquatic life with long lasting effects.

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SECTION 13: Disposal considerations

The information in this SDS pertains only to the product as shipped.

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

Disposal method : The product should not be allowed to enter drains, water courses or the soil. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.

Disposal precaution : Empty remaining contents. Dispose of as unused product. Do not re-use empty containers. Do not burn, or use a cutting torch on, the empty drum.

SECTION 14: Transport information

The shipping descriptions shown here are for bulk shipments only, and may not apply to shipments in non-bulk packages (see regulatory definition).

Consult the appropriate domestic or international mode-specific and quantity-specific Dangerous Goods Regulations for additional shipping description requirements (e.g., technical name or names, etc.) Therefore, the information shown here, may not always agree with the bill of lading shipping description for the material. Flashpoints for the material may vary slightly between the SDS and the bill of lading.

UN Number	:	UN2966
UN Product Shipping Name	:	THIOGLYCOL
Hazard Class	:	6.1
Packing Group	:	II - Hazardous Properties
Marine Pollutant	:	Yes
Special Safety Measures on Mode of Transport	:	No data available

US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)

UN2966, THIOGLYCOL, 6.1, II

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)

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UN2966, THIOGLYCOL, 6.1, II, (68.3°C), MARINE POLLUTANT, (THIOGLYCOL)

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)

UN2966, THIOGLYCOL, 6.1, II

ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))

UN2966, THIOGLYCOL, 6.1, II, (D/E), ENVIRONMENTALLY HAZARDOUS, (THIOGLYCOL)

RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))

UN2966, THIOGLYCOL, 6.1, II, ENVIRONMENTALLY HAZARDOUS, (THIOGLYCOL)

ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)

UN2966, THIOGLYCOL, 6.1, II, ENVIRONMENTALLY HAZARDOUS, (THIOGLYCOL)

Maritime transport in bulk according to IMO instruments**SECTION 15: Regulatory information****National legislation****Regulation under the Occupational Safety and Health Act**

A Material Safety Datasheet (MSDS) for this product is not required according to article 41 of the ISHA.

Regulation	Chemical name	Threshold limits
Harmful Substances Prohibited from Manufacturing	:	Not applicable
Harmful Substances Required	:	Not applicable

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Permission for Manufacture	
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Act on the Registration and Evaluation, etc. of Chemical Substances, Chemicals Control Act

Regulation	Chemical name	Threshold limits
Toxic Chemicals	: Not applicable	
Prohibited Chemicals	: Not applicable	
Restricted Chemicals	: Not applicable	
Toxic Release Inventory	: Not applicable	

Dangerous Substances Safety Management Act

Dangerous Substances : Flammable liquids, Type 2 petroleums, Water insoluble liquid
 Safety Management Act

Regulations by the Waste Management Act : Not applicable

Regulations by other domestic and foreign laws

Europe REACH : This product is in full compliance according to REACH regulation 1907/2006/EC.
 Switzerland CH INV : On the inventory, or in compliance with the inventory
 United States of America (USA) TSCA : On or in compliance with the active portion of the TSCA inventory
 Canada DSL : All components of this product are on the Canadian DSL
 Australia AIIC : On the inventory, or in compliance with the inventory
 New Zealand NZIoC : On the inventory, or in compliance with the inventory
 Japan ENCS : On the inventory, or in compliance with the inventory
 Korea KECI : All substances in this product were registered, notified to be registered, or exempted from registration by CPChem through an Only Representative according to K-REACH regulations. Importation of this product is permitted if the Korean Importer of Record was included on CPChem's notifications or if the Importer of Record themselves notified the substances.
 Philippines PICCS : On the inventory, or in compliance with the inventory
 Taiwan TCSI : On the inventory, or in compliance with the inventory
 China IECSC : On the inventory, or in compliance with the inventory

Other regulations : No data available

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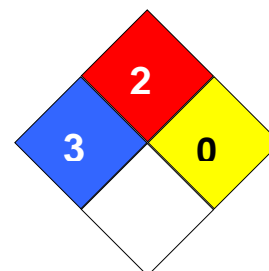
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SECTION 16: Other information

Source of data	:	Korea. GHS based classification
Date of initial writing	:	2023-09-27
Revision number	:	1
Last revision date	:	2023-11-27

NFPA Classification : Health Hazard: 3
Fire Hazard: 2
Reactivity Hazard: 0

**Other information**

None.

Significant changes since the last version are highlighted in the margin. This version replaces all previous versions.

The information in this SDS pertains only to the product as shipped.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Key or legend to abbreviations and acronyms used in the safety data sheet			
ACGIH	American Conference of Government Industrial Hygienists	LD50	Lethal Dose 50%
AIIC	Australian Inventory of Industrial Chemicals	LOAEL	Lowest Observed Adverse Effect Level
DSL	Canada, Domestic Substances List	NFPA	National Fire Protection Agency
NDSL	Canada, Non-Domestic Substances List	NIOSH	National Institute for Occupational Safety & Health
CNS	Central Nervous System	NTP	National Toxicology Program
CAS	Chemical Abstract Service	NZIoC	New Zealand Inventory of Chemicals
EC50	Effective Concentration	NOAEL	No Observable Adverse Effect Level

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EC50	Effective Concentration 50%	NOEC	No Observed Effect Concentration
EGEST	EOSCA Generic Exposure Scenario Tool	OSHA	Occupational Safety & Health Administration
EOSCA	European Oilfield Specialty Chemicals Association	PEL	Permissible Exposure Limit
EINECS	European Inventory of Existing Chemical Substances	PICCS	Philippines Inventory of Commercial Chemical Substances
MAK	Germany Maximum Concentration Values	PRNT	Presumed Not Toxic
GHS	Globally Harmonized System	RCRA	Resource Conservation Recovery Act
>=	Greater Than or Equal To	STEL	Short-term Exposure Limit
IC50	Inhibition Concentration 50%	SARA	Superfund Amendments and Reauthorization Act.
IARC	International Agency for Research on Cancer	TLV	Threshold Limit Value
IECSC	Inventory of Existing Chemical Substances in China	TWA	Time Weighted Average
ENCS	Japan, Inventory of Existing and New Chemical Substances	TSCA	Toxic Substance Control Act
KECI	Korea, Existing Chemical Inventory	UVCB	Unknown or Variable Composition, Complex Reaction Products, and Biological Materials
<=	Less Than or Equal To	WHMIS	Workplace Hazardous Materials Information System
LC50	Lethal Concentration 50%	ATE	Acute toxicity estimate