

**2-Mercaptoethanol (BME)**

Version 1.10

Revision Date 2015-05-11

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

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

Use : Chemical intermediate

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

Emergency telephone:**Health:**

866.442.9628 (North America)

1.832.813.4984 (International)

Transport:

North America: CHEMTREC 800.424.9300 or 703.527.3887

Asia: +800 CHEMCALL (+800 2436 2255) China: +86-21-22157316

EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600

Responsible Department : Product Safety and Toxicology Group
E-mail address : SDS@CPChem.com
Website : www.CPChem.com

SECTION 2: Hazards identification**Classification of the substance or mixture**

This product has been classified in accordance with the hazard communication standard 29 CFR 1910.1200; the SDS and labels contain all the information as required by the standard.

Emergency Overview**Danger**

Form: Liquid **Physical state:** Liquid **Color:** Water white **Odor:** Repulsive

OSHA Hazards : Combustible Liquid, Toxic by inhalation., Toxic by ingestion,
Toxic by skin absorption, Moderate skin irritant, Severe eye irritant

Classification

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: Flammable liquids , Category 4
 Acute toxicity , Category 3 , Oral
 Acute toxicity , Category 3 , Inhalation
 Acute toxicity , Category 2 , Dermal
 Skin irritation , Category 2
 Serious eye damage , Category 1
 Skin sensitization , Category 1
 Specific target organ systemic toxicity - repeated exposure ,
 Category 2 , Heart, Liver

Labeling

Symbol(s)

:



Signal Word

: Danger

Hazard Statements

: H227: Combustible liquid.
 H301 + H331: Toxic if swallowed or if inhaled.
 H310: Fatal in contact with skin.
 H315: Causes skin irritation.
 H317: May cause an allergic skin reaction.
 H318: Causes serious eye damage.
 H373: May cause damage to organs (Heart, Liver) through
 prolonged or repeated exposure.

Precautionary Statements

: **Prevention:**
 P210 Keep away from heat/sparks/open flames/hot surfaces.
 - No smoking.
 P260 Do not breathe dust/fume/gas/mist/vapor/spray.
 P262 Do not get in eyes, on skin, or on clothing.
 P264 Wash skin 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 must not be allowed out of
 the workplace.
 P280 Wear protective gloves/ eye protection/ face protection.
Response:
 P301 + P310 IF SWALLOWED: Immediately call a POISON
 CENTER or doctor/ physician.
 P302 + P350 IF ON SKIN: Gently wash with plenty of soap
 and water.
 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.
 P310 Immediately call a POISON CENTER or doctor/
 physician.
 P330 Rinse mouth.
 P333 + P313 If skin irritation or rash occurs: Get medical
 advice/ attention.
 P361 Remove/Take off immediately all contaminated
 clothing.
 P370 + P378 In case of fire: Use dry sand, dry chemical or
 alcohol-resistant foam for extinction.
Storage:

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

P403 + P235 Store in a well-ventilated place. Keep cool.

P405 Store locked up.

Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

Carcinogenicity:**IARC**

No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP

No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

ACGIH

No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

SECTION 3: Composition/information on ingredients

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

Molecular formula : HSCH₂CH₂OH

Component	CAS-No.	Weight %
2-Mercaptoethanol	60-24-2	99 - 100

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.

If inhaled : If unconscious place in recovery position and seek medical advice. If symptoms persist, call a physician.

In case of skin contact : Take victim immediately to hospital. If on skin, rinse well with water. If on clothes, remove clothes.

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

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specialist.

If swallowed : Keep respiratory tract clear. Do NOT induce vomiting. Do not give milk or alcoholic beverages. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician. Take victim immediately to hospital.

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.

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 an open flame or any other incandescent material. Keep away from open flames, hot surfaces and sources of ignition.

SECTION 6: Accidental release measures

Personal precautions : Use personal protective equipment.

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**

MSDS Number:100000013444

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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 an open flame or any other incandescent material. Keep away from open flames, hot surfaces and sources of ignition.

Storage

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.

SECTION 8: Exposure controls/personal protection**Ingredients with workplace control parameters**

US

Ingredients	Basis	Value	Control parameters	Note
2-Mercaptoethanol	US WEEL	TWA	0.2 ppm,	

Engineering measures

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 : Wear a supplied-air NIOSH approved respirator unless ventilation or other engineering controls are adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure. Wear a NIOSH approved respirator that provides protection when working with this material if exposure to harmful levels of airborne material may occur, such as: Full-Face Supplied-Air Respirator. Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.

Hand protection : The suitability for a specific workplace should be discussed

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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.

- Eye protection : Eye wash bottle with pure water. Wear face-shield and protective suit for abnormal processing problems.
- 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.. Personal protection through wearing a tightly closed chemical protection suit and a self-contained breathing apparatus. Flame-resistant clothing. Footwear protecting against chemicals. Rubber apron.
- 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**

- Form : Liquid
- Physical state : Liquid
- Color : Water white
- Odor : Repulsive

Safety data

- Flash point : 68.3 °C (154.9 °F)
Method: Tag closed cup
- Lower explosion limit : 2.3 %(V)
- Upper explosion limit : 18 %(V)
- Oxidizing properties : no
- Autoignition temperature : 295 °C (563 °F)
estimated
- Molecular formula : HSCH₂CH₂OH
- Molecular weight : No data available
- pH : Not applicable
- Pour point : No data available
- Freezing point : No data available

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Boiling point/boiling range	: 155 - 160 °C (311 - 320 °F)
Vapor pressure	: 5.70 MMHG at 37.8 °C (100.0 °F)
Relative density	: 1.12 at 15.6 °C (60.1 °F)
Density	: 1.12 G/ML
Partition coefficient: n-octanol/water	: Pow: 0.56
Viscosity, dynamic	: 3.42 cP
Relative vapor density	: 2.69 (Air = 1.0)
Evaporation rate	: 1
Percent volatile	: > 99 %

SECTION 10: Stability and reactivity

Chemical stability	: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
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Possibility of hazardous reactions

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

2-Mercaptoethanol (BME) Acute oral toxicity	: LD50: 133 mg/kg Species: Rat
2-Mercaptoethanol (BME) Acute inhalation toxicity	: LC50: 2.1 mg/l Exposure time: 4 h Species: Rat Sex: male Test atmosphere: vapor
2-Mercaptoethanol (BME) Acute dermal toxicity	: LD50: ca. 112 - 224 mg/kg

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Species: Rabbit
Sex: male and female

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Skin irritation : Extremely corrosive and destructive to tissue.

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Eye irritation : May cause irreversible eye damage.

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Sensitization : Causes sensitization.

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

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

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.

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CMR effects

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

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Further information : No data available.

SECTION 12: Ecological information**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)
static test Method: OECD Test Guideline 201

M-Factor

2-mercaptoethanol : 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

Bioaccumulation

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

Biodegradability

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

Ecotoxicology Assessment**Acute aquatic toxicity**

2-Mercaptoethanol : Very toxic to aquatic life.

Chronic aquatic toxicity

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

Results of PBT assessment

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

Additional ecological information

: An environmental hazard cannot be excluded in the event of unprofessional handling or disposal., Very toxic to aquatic life with long lasting effects.

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.

Product : 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.

Contaminated packaging : 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.

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US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)

UN2966, THIOGLYCOL, 6.1, II

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)

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)

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

SECTION 15: Regulatory information**National legislation**

SARA 311/312 Hazards : Fire Hazard
Acute Health Hazard

EPCRA - EMERGENCY PLANNING COMMUNITY RIGHT - TO – KNOW

CERCLA Reportable Quantity : This material does not contain any components with a CERCLA RQ.

SARA 302 Reportable Quantity : This material does not contain any components with a SARA 302 RQ.

SARA 302 Threshold Planning Quantity : No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 304 Reportable : This material does not contain any components with a section

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Quantity 304 EHS RQ.

SARA 313 Ingredients : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Clean Air Act

Ozone-Depletion Potential : This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 12 (40 CFR 61).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCM Intermediate or Final VOC's (40 CFR 60.489).

US State Regulations

Pennsylvania Right To Know : 2-Mercaptoethanol - 60-24-2

New Jersey Right To Know : 2-Mercaptoethanol - 60-24-2

California Prop. 65 Ingredients : This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

Notification status

Europe REACH	:	On the inventory, or in compliance with the inventory
United States of America TSCA	:	On the inventory, or in compliance with the inventory
Canada DSL	:	On the inventory, or in compliance with the inventory
Australia AICS	:	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	:	On the inventory, or in compliance with the inventory

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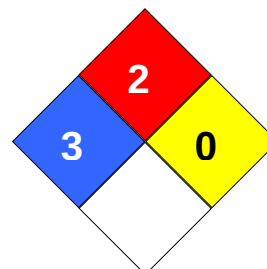
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Philippines PICCS : On the inventory, or in compliance with the inventory
 China IECSC : On the inventory, or in compliance with the inventory

SECTION 16: Other information

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

**Further information**

Legacy SDS Number : 26290

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%
AICS	Australia, Inventory of Chemical Substances	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
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

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			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%		