


Sulfole® 90 Mercaptan (tert-nonyl Mercaptan)

Version 2.9

Revision Date 2022-12-13

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

Product Name : Sulfole® 90 Mercaptan (tert-nonyl Mercaptan)
 Material : 1126986, 1126664, 1117043, 1017941, 1075361, 1087834,
 1033724, 1024815, 1021521, 1024814, 1021518, 1021520,
 1021522, 1021523, 1021718, 1021519

Use : Chemical intermediate

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

Local : See Company Address

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)

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 (Giftlinjen): +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)

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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

SECTION 2: Hazards identification**Classification of the substance or mixture****GHS Classification and labelling according to JIS Z7252-2014 and JIS Z7253-2012 (GHS 2011)****Classification**

: Flammable liquids, Category 4
 Short-term (acute) aquatic hazard, Category 1
 Long-term (chronic) aquatic hazard, Category 1

Labeling

Symbol(s) :



Signal Word : Warning

Hazard Statements : H227: Combustible liquid.
 H410: Very toxic to aquatic life with long lasting effects.

Precautionary Statements : **Prevention:**
 P210: Keep away from heat/ sparks/ open flames/ hot
 surfaces. No smoking.
 P273: Avoid release to the environment.
 P280: Wear protective gloves/ eye protection/ face protection.
Response:
 P370 + P378: In case of fire: Use dry sand, dry chemical or
 alcohol-resistant foam to extinguish.
 P391: Collect spillage.
Storage:
 P403 + P235: Store in a well-ventilated place. Keep cool.
Disposal:

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

SECTION 3: Composition/information on ingredients

Synonyms : tert-Nonyl Mercaptan
TNM
1,1-dimethylheptanethiol
Tertiary Nonyl Mercaptan
tert-Nonanethiol

Molecular formula : C₉H₂₀S

Chemical name	CAS-No.	Concentration	ENCS/ISHL number
tert-Nonanethiol	25360-10-5	95 % - 100%	2-464

SECTION 4: First aid measures

General advice : Move out of dangerous area. 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 : If on skin, rinse well with water. If on clothes, remove clothes.

In case of eye contact : Flush eyes with water as a precaution. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.

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.

SECTION 5: Firefighting measures

Flash point : 64°C (147°F)
Method: Tag closed cup

Autoignition temperature : 212°C (414°F)
at 99.50 kPa

Suitable extinguishing media : Carbon dioxide (CO₂).

Unsuitable extinguishing media : High volume water jet.

Specific hazards during fire : Do not allow run-off from fire fighting to enter drains or water

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fighting	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 a naked flame or any incandescent material. Keep away from open flames, hot surfaces and sources of ignition.
Hazardous decomposition products	: Carbon oxides. Sulfur oxides.

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. 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.

Storage

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Requirements for storage areas and containers : No smoking. Keep in a 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.

Use : Chemical intermediate

SECTION 8: Exposure controls/personal protection**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 : 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: Full-Face Air-Purifying Respirator for Organic Vapors, Dusts and Mists. 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.

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.

Eye protection : Eye wash bottle with pure water. Tightly fitting safety goggles.

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. Footwear protecting against chemicals.

Hygiene measures : When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

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

SDS Number:100000013778

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Appearance

Form : liquid
Physical state : liquid
Color : Colorless
Odor : Repulsive

Safety data

Flash point : 64°C (147°F)
Method: Tag closed cup

Lower explosion limit : No data available

Upper explosion limit : No data available

Autoignition temperature : 212°C (414°F)
at 99.50 kPa

Molecular formula : C₉H₂₀S

Molecular weight : 160.35 g/mol

pH : Not applicable

Freezing point : <-20.0°C (<-4.0°F)

Boiling point/boiling range : 194°C (381°F)
at 101.06 kPa

Vapor pressure : 144.00 Pa
at 25.0°C (77.0°F)

Relative density : 0.852
at 20.0 °C (68.0 °F)

Water solubility : 16.6 MG/L
at 20°C (68°F)

Partition coefficient: n-
octanol/water : log Pow: 4.21
at 20°C (68°F)

Solubility in other solvents : Medium: Water
negligible

Viscosity, dynamic : 2.84 cP

Viscosity, kinematic : 1.72 mm²/s
at 20°C (68°F)

Relative vapor density : 1
(Air = 1.0)

Evaporation rate : 1

Percent volatile : > 99 %

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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.

Further information: No decomposition if stored and applied as directed.

Hazardous reactions: Vapors may form explosive mixture with air.

Conditions to avoid : Heat, flames and sparks.

Hazardous decomposition products : Carbon oxides
Sulfur oxides

Other data : No decomposition if stored and applied as directed.

SECTION 11: Toxicological information**Acute oral toxicity**

tert-Nonanethiol : LD50: 5,550 mg/kg
Species: Rat
Method: OECD Test Guideline 401
Symptoms: Disorientation, Loss of balance

Acute inhalation toxicity

tert-Nonanethiol : LC50: > 7.04 mg/l
Exposure time: 4.5 h
Species: Rat
Sex: male and female
Test atmosphere: vapor
Method: OECD Test Guideline 403

Acute dermal toxicity

tert-Nonanethiol : LD50: > 2,000 mg/kg
Species: Rat
Sex: male
Method: OECD Test Guideline 402

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Skin irritation

tert-Nonanethiol : No skin irritation
largely based on animal evidence.

Eye irritation

tert-Nonanethiol : No eye irritation
largely based on animal evidence.

Sensitization

tert-Nonanethiol : The results of a test on guinea pigs showed this substance to be a weak skin sensitizer.

Repeated dose toxicity

tert-Nonanethiol : Species: Rat, male and female
Sex: male and female
Application Route: Inhalation
Dose: 0, 26, 98 ppm
Exposure time: 4 wk
Number of exposures: 6 h/d, 5 days/wk
Lowest observable effect level: 26 ppm
Method: OECD Guideline 412
Target Organs: Kidney, Liver
Information given is based on data obtained from similar substances.

Species: Rat, female
Sex: female
Application Route: Inhalation
Dose: 5, 25, 100 ppm
Exposure time: 13 wk
Number of exposures: 6h/d, 5d/wk
NOEL: 25 ppm
Method: OECD Test Guideline 413
Information given is based on data obtained from similar substances.

Species: Rat, male
Sex: male
Application Route: Inhalation
Dose: 5, 25, 100 ppm
Exposure time: 13 wk
Number of exposures: 6h/d, 5d/wk
NOEL: 25 ppm
Method: OECD Test Guideline 413
Information given is based on data obtained from similar substances.

Genotoxicity in vitro

tert-Nonanethiol : Test Type: Ames test
Metabolic activation: with and without metabolic activation
Method: Mutagenicity (Escherichia coli - reverse mutation assay)
Result: negative
Remarks: In vitro tests did not show mutagenic effects

Developmental Toxicity

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tert-Nonanethiol : Species: Rat
 Application Route: Inhalation
 Dose: 0, 22.7, 88.6 ppm
 Number of exposures: 6 h/d
 Test period: GD 6 - 19
 Method: OECD Guideline 414
 NOAEL Teratogenicity: >= 88.6 ppm
 NOAEL Maternal: >= 88.6 ppm
 No adverse effects expected
 Information given is based on data obtained from similar substances.

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Aspiration toxicity : May be harmful if swallowed and enters airways.

CMR effects

tert-Nonanethiol : Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects.
 Teratogenicity: Animal testing did not show any effects on fetal development.

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Further information : Solvents may decrease the skin. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting.

SECTION 12: Ecological information**Toxicity to fish**

tert-Nonanethiol : No data available

Toxicity to daphnia and other aquatic invertebrates

tert-Nonanethiol : EC50: 0.090 mg/l
 Exposure time: 48 h
 Species: Daphnia magna (Water flea)
 Immobilization Method: OECD Test Guideline 202

Toxicity to algae

tert-Nonanethiol : No data available

M-Factor

1,1-dimethylheptanethiol	: M-Factor (Acute Aquat. Tox.)	10
	M-Factor (Chron. Aquat. Tox.)	10

Biodegradability

tert-Nonanethiol : aerobic

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Result: Not readily biodegradable.
 0 %
 Testing period: 28 d
 Method: Directive 67/548/EEC Annex V, C.4.D.

Bioaccumulation

tert-Nonanethiol : Accumulation in aquatic organisms is unlikely.
 Information given is based on data obtained from similar substances.

Mobility

tert-Nonanethiol : No data available

Results of PBT assessment

tert-Nonanethiol : Non-classified PBT substance, Non-classified vPvB substance

Additional ecological information : Very toxic to aquatic life with long lasting effects.

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

tert-Nonanethiol : Very toxic to aquatic life.

Long-term (chronic) aquatic hazard

tert-Nonanethiol : 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

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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.

US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)

NA1993, COMBUSTIBLE LIQUID, N.O.S., (TERT-NONANETHIOL), III

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)

UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (TERT-NONANETHIOL), 9, III, (64 °C c.c.), MARINE POLLUTANT, (TERT-NONANETHIOL)

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)

UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (TERT-NONANETHIOL), 9, III

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

UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (TERT-NONANETHIOL), 9, III, (-)

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

90, UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (TERT-NONANETHIOL), 9, III

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

UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (TERT-NONANETHIOL), 9, III

Maritime transport in bulk according to IMO instruments

SECTION 15: Regulatory information**National legislation****Poisonous and Deleterious Substances Control Law**

: Not applicable

Industrial Safety and Health Law

Substances Subject to be : Not applicable

Notified Names

Enforcement Order of the : Inflammable Substance

Industrial Safety and Health
Law - Attached table 1

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(Dangerous Substances)
Enforcement Order of the
Industrial Safety and Health
Law - Attached table 1
(Dangerous Substances)

: Inflammable Substance

Harmful Substances Required
Permission for Manufacture
Hazardous Substances
Subject to Labeling
Requirements

: Not applicable

: Not applicable

Ordinance on Prevention of
Organic Solvent Poisoning
Ordinance on Prevention of
Lead Poisoning

: Not applicable

: Not applicable

Harmful Substances
Prohibited from Manufacture

: Not applicable

Ordinance on Prevention of
Hazards Due to Specified
Chemical Substances

: Not applicable

Ordinance on Prevention of
Tetraalkyl Lead Poisoning

: Not applicable

: Not applicable

: Not applicable

Substances Prevented From
Impairment of Health

: Not applicable

Listed

Chemical Substance Control Law

: Not applicable for Specified Chemical Substance, Monitoring Chemical Substance and Priority Assessment Chemical Substance.

Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof

: Not applicable

Other regulations

Fire Service Law : Flammable liquids
Type 2 petroleums
Hazardous rank III

High Pressure Gas Safety Act : Not applicable

Explosive Control Law : Not applicable

Vessel Safety Law : Miscellaneous dangerous substances and articles (Article 2 and 3 of rules on shipping and storage of dangerous goods and its Attached Table 1)

Aviation Law : Miscellaneous dangerous substances and articles (Article 194 of The Enforcement Rules of Aviation Law and its Attached

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Table 1)

Notification status

Europe REACH	:	This mixture contains only ingredients which have been registered according to Regulation (EU) No. 1907/2006 (REACH).
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
Other AICS	:	On the inventory, or in compliance with the inventory
New Zealand NZIoC	:	Not in compliance with the inventory
Japan ENCS	:	On the inventory, or in compliance with the inventory
Korea KECI	:	A substance(s) in this product was not registered, notified to be registered, or exempted from registration by CPChem according to K-REACH regulations. Importation or manufacture of this product is still permitted provided the Korean Importer of Record has themselves notified the substance or the exported amount does not exceed the minimum threshold quantity of the non-registered substance(s).
Philippines PICCS	:	On the inventory, or in compliance with the inventory
China IECSC	:	On the inventory, or in compliance with the inventory
Taiwan TCSI	:	On the inventory, or in compliance with the inventory

SECTION 16: Other information**Further information**

Legacy SDS Number : 99840

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

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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 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