

AlphaPlus® 1-BUTENE

Version 2.4

Revision Date 2023-11-09

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

Product Name : AlphaPlus® 1-BUTENE
Material : 1122418, 1036988, 1015419, 1037080, 1037081

Company : Chevron Phillips Chemical Company LP
Normal Alpha Olefins (NAO)
10001 Six Pines Drive
The Woodlands, TX 77380

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 (Gifftlinjen): +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)

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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**

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.

Classification

: Flammable gases, Category 1
 Gases under pressure, Liquefied gas

Labeling

Symbol(s)



Signal Word

: Danger

Hazard Statements

: H220: Extremely flammable gas.
 H280: Contains gas under pressure; may explode if heated.

Precautionary Statements

: **Prevention:**
 P210 Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
Response:
 P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
 P381 Eliminate all ignition sources if safe to do so.
Storage:
 P410 + P403 Protect from sunlight. Store in a well-ventilated place.

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

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equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

SECTION 3: Composition/information on ingredients

Synonyms : Ethylethylene
1-Butylene
Alpha-butene
Butene-1 (C4)
Alpha-Butylene
C4H8

Molecular formula : C4H8

Component	CAS-No.	Weight %
1-Butene	106-98-9	99 - 99.99
n-Butane	106-97-8	0 - 1

SECTION 4: First aid measures

General advice : Move out of dangerous area. Show this material safety data sheet to the doctor in attendance.

If inhaled : Call a physician or poison control center immediately. Keep patient warm and at rest. If unconscious, place in recovery position and seek medical advice. Keep respiratory tract clear.

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.

SECTION 5: Firefighting measures

Flash point : -80°C (-112°F)

Autoignition temperature : 383.89°C (723.00°F)

Suitable extinguishing media : Alcohol-resistant foam. Carbon dioxide (CO₂). Dry chemical.

Unsuitable extinguishing media : High volume water jet.

Specific hazards during fire fighting : Standard procedure for chemical fires. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Special protective equipment for fire-fighters : Wear self-contained breathing apparatus for firefighting if necessary.

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- Further information : 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. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use only explosion-proof equipment. Keep away from open flames, hot surfaces and sources of ignition.
- Hazardous decomposition products : Carbon oxides.

SECTION 6: Accidental release measures

- Personal precautions : Use personal protective equipment. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.
- 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 : Ventilate the area.

SECTION 7: Handling and storage**Handling**

- Advice on safe handling : Do not breathe vapors/dust. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Take precautionary measures against static discharges. Provide sufficient air exchange and/or exhaust in work rooms. Container may be opened only under exhaust ventilation hood. Open drum carefully as content may be under pressure. Dispose of rinse water in accordance with local and national regulations.
- Advice on protection against fire and explosion : Do not spray on a naked flame or any incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use only explosion-proof equipment. 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. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.

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

Components	Basis	Value	Control parameters	Note
1-Butene	ACGIH	TWA	250 ppm,	
n-Butane	OSHA Z-1-A	TWA	800 ppm, 1,900 mg/m3	
	ACGIH	STEL	1,000 ppm,	CNS impair, EX,

CNS impair Central Nervous System impairment

EX Explosion hazard: the substance is a flammable asphyxiant or excursions above the TLV @ could approach 10% of the lower explosive limit.

Immediately Dangerous to Life or Health Concentrations (IDLH)

Substance name	CAS-No.	Control parameters	Update
n-Butane	106-97-8	Immediately Dangerous to Life or Health Concentration Value 1600 parts per million	2017-02-03
		Immediately Dangerous to Life or Health Concentration Value 1600 parts per million	2017-02-03

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: Air-Purifying Respirator for Organic Vapors. 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. Safety glasses.

Skin and body protection : Choose body protection according to the amount and concentration of the substance and the task performed at the work place. Appropriate PPE may include: Flame retardant

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antistatic protective clothing. Workers should wear antistatic footwear.

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****Appearance**

Form : Liquefied gas, Gases under pressure
 Physical state : Gaseous
 Color : Colorless

Safety data

Flash point : -80°C (-112°F)

Lower explosion limit : 1.6 %(V)

Upper explosion limit : 9.3 %(V)

Oxidizing properties : no

Autoignition temperature : 383.89°C (723.00°F)

Molecular formula : C₄H₈

Molecular weight : 56.12 g/mol

pH : Not applicable

Freezing point : -185°C (-301°F)

Pour point : No data available

Boiling point/boiling range : -6.26°C (20.73°F)

Vapor pressure : 1,895.00 MMHG
at 20°C (68°F)

Relative density : 0.6
at 15.6 °C (60.1 °F)

Density : 600.3 g/l

Water solubility : Soluble in hydrocarbon solvents; insoluble in water.

Partition coefficient: n-octanol/water : No data available

Viscosity, kinematic : No data available

Relative vapor density : 1.93
(Air = 1.0)

Evaporation rate : No data available

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Percent volatile : > 99 %

SECTION 10: Stability and reactivity**Reactivity** : Stable at normal ambient temperature and pressure.**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** : 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.**Materials to avoid** : May react with oxygen and strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.**Hazardous decomposition products** : Carbon oxides**Other data** : No decomposition if stored and applied as directed.**SECTION 11: Toxicological information****AlphaPlus® 1-BUTENE
Acute oral toxicity** : Negligible or unlikely exposure pathways**AlphaPlus® 1-BUTENE
Acute inhalation toxicity** : LC50: > 10000 ppm
Exposure time: 4 h
Species: Rat
Test atmosphere: gas
Method: OECD Test Guideline 403
Information given is based on data obtained from similar substances.**AlphaPlus® 1-BUTENE
Acute dermal toxicity** : Negligible or unlikely exposure pathways**AlphaPlus® 1-BUTENE
Skin irritation** : No skin irritation. Rapid evaporation of the liquid may cause frostbite.

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AlphaPlus® 1-BUTENE**Eye irritation**

: No eye irritation. Contact with liquid or refrigerated gas can cause cold burns and frostbite.

AlphaPlus® 1-BUTENE**Sensitization**

: No data available.

Repeated dose toxicity

1-Butene

: Species: Rat, Male and female
Sex: Male and female
Application Route: Inhalation
Dose: 0, 500, 2000, 8000 ppm
Exposure time: 28 d
Number of exposures: 6 hr/d, 7 d/wk
NOEL: 8000 ppm
Method: OECD Guideline 422
No adverse effect has been observed in chronic toxicity tests.

n-Butane

Species: Rat, Male and female
Sex: Male and female
Application Route: Inhalation
Dose: 0, 1017, 4489 ppm
Exposure time: 90 day
Number of exposures: 6 hr/d, 5 d/wk
NOEL: 4489 ppm**Genotoxicity in vitro**

1-Butene

: Test Type: Ames test
Metabolic activation: with and without metabolic activation
Result: negative

n-Butane

Test Type: Ames test
Result: negative**Genotoxicity in vivo**

1-Butene

: Test Type: Micronucleus test
Species: Mouse
Dose: 1000, 3260, 10000 ppm
Method: Mutagenicity (micronucleus test)
Result: negative**Carcinogenicity**

1-Butene

: Species: Rat
Sex: male
Dose: 0, 500, 2000, 8000 ppm
Exposure time: 2 years
Number of exposures: 6 hr/d, 5 d/wk
Remarks: increased incidence of thyroid tumors, Information given is based on data obtained from similar substances.

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Species: Rat
 Sex: female
 Dose: 0, 500, 2000, 8000 ppm
 Exposure time: 2 years
 Number of exposures: 6 hr/d, 5 d/wk
 Remarks: no increase incidence of tumors, Information given is based on data obtained from similar substances.

Species: Mouse
 Sex: male
 Dose: 0, 500, 2000, 8000 ppm
 Exposure time: 2 years
 Number of exposures: 6 hr/d, 5 d/wk
 Remarks: no increase incidence of tumors, Information given is based on data obtained from similar substances.

Species: Mouse
 Sex: female
 Dose: 0, 500, 2000, 8000 ppm
 Exposure time: 2 years
 Number of exposures: 6 hr/d, 5 d/wk
 Remarks: no increase incidence of tumors, Information given is based on data obtained from similar substances.

Reproductive toxicity

1-Butene : Species: Rat
 Sex: male and female
 Application Route: Inhalation
 Dose: 0, 500, 2000, 8000 ppm
 Method: OECD Guideline 422
 NOAEL Parent: 8000 ppm
 NOAEL F1: 8000 ppm

CMR effects

1-Butene : Carcinogenicity: Weight of evidence does not support classification as a carcinogen
 Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects.
 Teratogenicity: Animal testing did not show any effects on fetal development.
 Reproductive toxicity: Animal testing did not show any effects on fertility.

n-Butane Carcinogenicity: Weight of evidence does not support classification as a carcinogen
 Mutagenicity: Weight of evidence does not support classification as a germ cell mutagen.
 Teratogenicity: Not available
 Reproductive toxicity: Weight of evidence does not support classification for reproductive toxicity

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Further information**

: No data available.

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

1-Butene : No data available

Toxicity to daphnia and other aquatic invertebrates

1-Butene : No data available

Toxicity to algae

1-Butene : No data available

Biodegradability : This material is expected to be readily biodegradable.

Elimination information (persistence and degradability)

Bioaccumulation

1-Butene : Bioconcentration factor (BCF): 17.8
Method: QSAR modeled data
This material is not expected to bioaccumulate.

n-Butane : This material is not expected to bioaccumulate.

Mobility

1-Butene : Medium: Air
Method: Calculation, Mackay Level I Fugacity Model
Content: 99.99 %: Medium: Water
Method: Calculation, Mackay Level I Fugacity Model
Content: 0.01 %

n-Butane : The product evaporates readily.

Results of PBT assessment

1-Butene : Non-classified PBT substance, Non-classified vPvB substance

n-Butane : This substance is not considered to be persistent,
bioaccumulating and toxic (PBT)., This substance is not
considered to be very persistent and very bioaccumulating
(vPvB).

Additional ecological information : No data available

Ecotoxicology Assessment

Short-term (acute) aquatic hazard : No data available

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Long-term (chronic) aquatic hazard : No data available

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 : Do not dispose of waste into sewer. 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.

US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)

UN1012, BUTYLENE, 2.1
NON- ODORIZED

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)

UN1012, BUTYLENE, 2.1, (-80 °C c.c.)
NON- ODORIZED

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)

UN1012, BUTYLENE, 2.1
NON- ODORIZED

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

UN1012, BUTYLENE, 2.1, (B/D)
NON- ODORIZED

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

23, UN1012, BUTYLENE, 2.1
NON- ODORIZED

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ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)UN1012, BUTYLENE, 2.1
NON- ODORIZED

Other information	:	Butylenes (all isomers), 2G/2PG
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Maritime transport in bulk according to IMO instruments**SECTION 15: Regulatory information****National legislation**

SARA 311/312 Hazards : Flammable (gases, aerosols, liquids, or solids)
Gases under pressure

CERCLA Reportable Quantity : Calculated RQ exceeds reasonably attainable upper limit.
1,3-Butadiene

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

SARA 302 Threshold Planning Quantity : This material does not contain any components with a section 302 EHS TPQ.

SARA 304 Reportable Quantity : This material does not contain any components with a section 304 EHS RQ.

SARA 313 Components : 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).

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This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

The following chemical(s) are listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F):

: 1-Butene - 106-98-9
n-Butane - 106-97-8

The following chemical(s) are listed under the U.S. Clean Air Act Section 111 SOCM I Intermediate or Final VOC's (40 CFR 60.489):

: 1-Butene - 106-98-9

US State Regulations

Pennsylvania Right To Know

: 1-Butene - 106-98-9
n-Butane - 106-97-8

California Prop. 65
Components

: WARNING: This product can expose you to chemicals including [listed below], which is [are] known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

1,3-Butadiene

106-99-0

Notification status

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 : Not in compliance with the inventory

Japan ENCS : On the inventory, or in compliance with the inventory

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

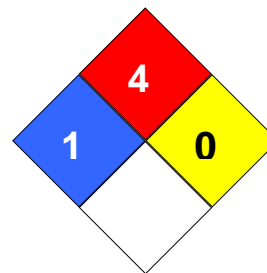
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SECTION 16: Other information

NFPA Classification : Health Hazard: 1
Fire Hazard: 4
Reactivity Hazard: 0

**Further information**

Legacy SDS Number : PE0015

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
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	TSCA	Toxic Substance Control Act

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	New Chemical Substances		
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