SAFETY DATA SHEETS

According to the UN GHS revision 10

1: Identification

1.1 GHS Product identifier

Product name	Tributyltin oxide

1.2 Other means of identification

Product number	56-35-9
Other names	Tributyltin oxide

1.3 Recommended use of the chemical and restrictions on use

Identified uses	Industrial and scientific research use.
Uses advised against	no data available

1.4 Supplier's details

Company	Zhongshan Greenrock Technology Co., Ltd.
Address	No. 138, Jinsan Avenue, Sanjiao Town, Zhongshan City, Guangdong Province, China
Telephone	+86-2087066781

1.5 Emergency phone number

Emergency phone number	+86-2087066781
Service hours	Monday to Friday, 9am-5pm (Standard time zone: UTC/GMT +8 hours).

2: Hazard identification

2.1 Emergency Overview

Highly toxic substances, even small amounts of which can cause death or serious health effects. They can enter the body through inhalation, skin contact, or ingestion. Immediate protective measures must be taken to avoid any contact.

2.2 GHS Classification

Acute toxicity, oral : Category 3
Acute toxicity, dermal : Category 4
Skin corrosion/irritation : Category 2
Serious eye damage/eye irritation : Category 2A
Acute toxicity, inhalation : Category 3
Reproductive toxicity : Category 1, 1A, 1B
Specific target organ toxicity, repeated exposure : Category 1
Specific target organ toxicity, repeated exposure : Category 2

Hazardous to the aquatic environment, acute hazard : Category 1
Hazardous to the aquatic environment, long-term hazard : Category 1

2.3 GHS label elements, including precautionary statements

Pictogram(s)

Signal word Danger

Hazard statement(s)

H301 Toxic if swallowed
H312 Harmful in contact with skin
H315 Causes skin irritation
H319 Causes serious eye irritation
H331 Toxic if inhaled
H360FD May damage fertility; May damage the unborn child
H372 Causes damage to organs through prolonged or repeated exposure
H373 May causes damage to organs through prolonged or repeated exposure
H400 Very toxic to aquatic life
H410 Very toxic to aquatic life with long lasting effects

Precautionary statement(s)

Prevention

P203 Obtain, read and follow all safety instructions before use.
P260 Do not breathe dust/fume/gas/mist/vapors/spray.
P261 Avoid breathing dust/fume/gas/mist/vapors/spray.
P264 Wash hands [and ...] thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P273 Avoid release to the environment.
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
P264+P265 Wash hands [and ...] thoroughly after handling. Do not touch eyes.

Response

P316 Get emergency medical help immediately.
P317 Get emergency medical help.
P318 if exposed or concerned, get medical advice.
P319 Get medical help if you feel unwell.
P321 Specific treatment (see ... on this label).
P330 Rinse mouth.
P391 Collect spillage.
P301+P316 IF SWALLOWED,Get emergency medical help immediately.
P302+P352 IF ON SKIN,wash with plenty of water/...
P304+P340 IF INHALED,Remove person to fresh air and keep 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.
P332+P317 If skin irritation occurs,Get medical help.
P337+P317 If eye irritation persists,Get medical help.
P362+P364 Take off contaminated clothing and wash it before reuse.

Storage

P405 Store locked up.
P403+P233 Store in a well-ventilated place. Keep container tightly closed.

Disposal	P501 Dispose of contents/container to ...

2.4 Physical and chemical

Some substances may also be flammable or corrosive. Mixing with other substances may produce toxic products. Highly volatile substances can form toxic vapor clouds, expanding the hazard range.

2.5 Health hazards

Acute toxicity,May cause respiratory failure, cardiac arrest, nervous system depression, or organ failure. Severe symptoms may appear within a short period of exposure (minutes to hours). Long-term effects may include permanent organ damage.

2.6 Environmental hazards

It is extremely toxic to aquatic organisms and terrestrial ecosystems, and even a small release can cause large-scale biological mortality. It may persist in the environment and accumulate through the food chain, causing long-term damage to ecosystems.

2.7 Other hazards which do not result in classification

no data available

3: Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
Tributyltin oxide	Tributyltin oxide	56-35-9	200-268-0	99%

4: First-aid measures

4.1 General advice

Stop contact immediately and move to a safe area; bring the material SDS document and call emergency services immediately; record the route of exposure (inhalation/skin/ingestion), exposure time and dosage for the doctor's judgment.

4.2 If inhaled

Quickly transfer the patient to a place with fresh air, keep the patient lying flat with the head tilted to one side (to prevent suffocation by vomitus); if cyanosis or breathing difficulties occur, immediately give oxygen (flow rate 5-10L/min); it is strictly forbidden to feed/drink water to the unconscious person, and seek medical attention immediately.

4.3 In case of skin contact

Immediately remove contaminated clothing (if clothing is stuck to the skin, cut it with scissors to avoid tearing it). Rinse the affected area with plenty of running water for 20-30 minutes (the water temperature

should be around 37°C, avoiding excessive heat or cold). If the skin is damaged, cover it with sterile gauze after rinsing. Do not apply ointment.

4.4 In case of eye contact

Immediately flush with an eyewash station for 15 minutes (open the eyelids to ensure thorough flushing of the upper and lower fornixes); wear a light-shielding eye mask after flushing to avoid strong light stimulation, and immediately seek medical attention from an ophthalmologist (bring along the substance SDS).

4.5 If swallowed

Self-induced vomiting is strictly prohibited (especially with corrosive and toxic substances, which may cause secondary burns to the esophagus). If the patient is conscious and not convulsing, they can drink 50-100ml of milk under the guidance of a doctor (to protect the gastric mucosa).

4.6 Most important symptoms and effects, both acute and delayed

Acute symptoms: nausea and vomiting, abdominal pain, dyspnea, convulsions, confusion, and decreased blood pressure; delayed symptoms: liver and kidney damage (appearing within 24-72 hours), methemoglobinemia (such as nitrite poisoning).

4.7 Protection of first-aiders

Rescuers must wear fully enclosed chemical protective clothing, a gas mask (with a targeted gas filter cartridge, such as for organic vapors and acid gases), and chemical protective gloves; avoid direct contact with the patient's vomitus/secretions, and wash hands immediately with chlorine-containing disinfectant after contact.

4.8 Notes to physician

Inform the physician of the substance's toxicity (e.g., oral LD50 = 5 mg/kg) and route of exposure; prioritize gastric lavage (physician evaluation required for appropriateness) and administer antidotes (e.g., atropine for organophosphate poisoning); monitor liver and kidney function, electrolytes, and coagulation function.

5: Fire-fighting measures

5.1 Unsuitable extinguishing media

It is strictly forbidden to use fire extinguishing agents that may cause the spread of toxic substances (such as high-pressure water jets); if flammable liquids are involved, avoid using carbon dioxide (which may cause toxic vapor condensation).

5.2 Specific hazards during fire fighting

Combustion may be accompanied by the release of highly toxic substances (such as cyanide and arsenide), which are fatal by inhalation or skin contact; the combustion of flammable components can easily cause explosions and intensify the spread of toxic substances; toxic vapors are heavier than air and tend to accumulate in low-lying areas.

5.3 Hazardous combustion products

Highly toxic gases (such as hydrogen chloride, hydrogen fluoride, phosgene), carbon monoxide, nitrogen oxides; some contain heavy metal components that release toxic fumes such as mercury and lead.

5.4 Specific extinguishing methods

For small areas: use dry powder fire extinguishing agent to extinguish the fire, and dilute the toxic vapor with mist water (avoid direct spraying); for large areas: give priority to evacuation. If fire extinguishing is necessary, set up a fire extinguishing point upwind and cover it with foam (to isolate oxygen); after extinguishing the fire, test the area for toxicity concentration (entry is allowed only when the value is below MAC).

5.5 Special protective equipment for fire-fighters

Wear fully enclosed chemical protective clothing, gas masks (with targeted gas filter boxes, such as organic vapor + acidic gas), and chemical protective gloves (made of fluororubber); carry a portable toxic gas detector; equipment must be disinfected after the operation, and personnel must undergo health monitoring.

6: Accidental release measures

6.1 Protective measures for workers

Wear fully enclosed chemical protective clothing, positive pressure air respirator, chemical protective gloves (toxic-resistant type) and goggles; avoid direct contact with the skin and wash immediately after work.

6.2 Environmental protection measure

Isolate the 30-meter contaminated area to prevent the leak from spreading through rainwater/groundwater; take samples of water/soil for testing, and use activated carbon adsorption (organic poison) or neutralizer (inorganic poison) for treatment when exceeding the standard; strictly prohibit the leak from entering the drinking water source.

6.3 Containment methods for leaked chemicals

Collect liquids in corrosion-resistant sealed containers (marked with "toxic substances"); collect solids in chemical-resistant bags (to avoid dust); and store them separately in a hazardous waste warehouse after collection, away from food/feed.

6.4 Cleanup methods for chemical spills

Small leakage: absorb with special absorbent cotton (toxic-resistant) and put into chemical-proof bag; large leakage: professionals use chemical-proof pump to transfer to special storage tank; after cleaning, treat the ground with neutralizer (weak base for acid poison and weak acid for alkali poison).

6.5 Measures to prevent the spread of leaks

Set up a 30-meter isolation zone and prohibit unauthorized personnel from entering; volatile toxic substances require explosion-proof ventilation to reduce gas concentration; use chemical defense isolation belts to block them, and focus on monitoring low-lying areas (to prevent the accumulation of toxic substances).

6.6 Container leakage treatment

Minor leaks: Seal with compatible sealant; Serious leaks: Evacuate immediately, close the upstream valve (if safe), and have the toxic material disposal team handle it. It is strictly forbidden to open the container without authorization.

6.7 Special considerations

Workers must receive poisoning first aid training and carry antidotes (if applicable). In case of skin contact, flush immediately with plenty of water for 15 minutes. In case of inhalation poisoning, move immediately to fresh air and seek medical attention.

7: Handling and storage

7.1 Safe storage conditions

Store in a closed, impermeable dedicated warehouse (the walls are made of anti-corrosion materials, such as polyethylene coating); the container is made of corrosion-resistant material (such as polytetrafluoroethylene, glass-lined steel), with a double sealing cover (threaded cover + nitrile rubber sealing ring); the warehouse is equipped with a negative pressure ventilation system (air changes ? 8 times/hour), and the exhaust gas must be treated with activated carbon adsorption (adsorption efficiency ? 95%).

7.2 Storage precautions

Store them separately from food, feed, and medicine (isolation distance ? 3 meters), and strictly prohibit them from being adjacent to drinking water sources; clearly mark "highly toxic" and H code on container labels and store them separately on locked shelves; check the sealing of containers weekly and immediately transfer them to the emergency treatment area if any leakage is found; workers must wear fully enclosed chemical protective clothing before entering the warehouse.

7.3 VCI Storage Grade

Level 1 (highest): The inner wall of the metal container is coated with a VCI anti-rust coating (thickness ? 50?m), and the outer surface of the container is wrapped with a vapor phase anti-rust film; the concentration of toxic substances in the warehouse is tested monthly to ensure that it is lower than the MAC value (for example, MAC of oral toxic substances ? 0.1mg/m³).

7.4 Recommended storage temperature

10-30?, avoid extreme temperatures (below 0? or above 35?); volatile toxic substances must be kept at a temperature ?25? to reduce vapor release; refrigerated storage substances (such as certain biotoxins) must be maintained at 2-8? and equipped with dual power supply protection (if the label has a recommended storage temperature, the label shall prevail).

7.5 Handling

For precautions see Safety Data Sheet section 2
Advice on safe handling : Work under hood. Do not inhale substance/mixture.

8: Exposure controls/personal protection

8.1 Respiratory protection

Choose according to the exposure route: volatile substances require positive pressure air respirators; dust/aerosols require powered air-purifying respirators to ensure the protection factor (APF) ? 1000.

8.2 Recommended Filter type

For organic toxic substances, choose Type A filter cartridge (to protect against organic vapors, such as benzene and methanol); for inorganic toxic substances, choose Type B (to protect against ammonia) or Type E (to protect against acidic gases, such as hydrogen chloride); for dust, add Type P3 filter cotton.

8.3 Eye/face protection

Wear a full-face chemical protective mask. The mask material must be resistant to toxic penetration (such as fluororubber), and the lens must be anti-fog and anti-chemical corrosion.

8.4 Skin and body protection

Wear fully enclosed chemical protective clothing. The material must be compatible with toxic substances (such as polyethylene + neoprene composite material); the cuffs and ankles must be tightened and equipped with emergency escape zippers.

8.5 Hand protection

Wear toxic and chemical-resistant gloves, preferably made of fluororubber or butyl rubber, with a length of ?30 cm, covering the forearm, and change every 4 hours

8.6 Hygiene measures

Immediately after the operation, clean the skin with a special detergent (such as a weak alkaline detergent), and then rinse with running water for 15 minutes; clothes need to be disinfected at high temperature (above 60°C) before washing; regular physical examinations (blood routine, liver and kidney function tests every 3 months).

9: Physical and chemical properties and safety characteristics

Physical state	Clear colorless liquid
Colour	Slightly yellow liquid.
Odour	Weak odor
Melting point/freezing point	-45oC
Boiling point or initial boiling point and boiling range	180°C/2mmHg(lit.)
Flammability	Combustible.
Lower and upper explosion limit/flammability limit	no data available
Flash point	190°C

Auto-ignition temperature	no data available
Decomposition temperature	When heated to decomposition it emits acrid and irritating fumes.
pH	no data available
Kinematic viscosity	4.8 Centistokes at 25°C
Solubility	In water:INSOLUBLE
Partition coefficient n-octanol/water	log Kow= 3.84
Vapour pressure	<0.01 mm Hg (25 °C)
Density and/or relative density	1.17g/mLat 25°C(lit.)
Relative vapour density	no data available
Particle characteristics	no data available

10: Stability and reactivity

10.1 Reactivity

no data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

Combustible.BIS(TRIBUTYLTIN) OXIDE may react vigorously with oxidizing agents and with reducing agents.

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

no data available

10.6 Hazardous decomposition products

When heated to decomposition it emits acrid and irritating fumes.

11: Toxicological information

11.1 Acute toxicity

Oral: LD50 Rat oral 194 mg/kg
Inhalation: no data available
Dermal: no data available

11.2 Skin corrosion/irritation

no data available

11.3 Serious eye damage/irritation

no data available

11.4 Respiratory or skin sensitization

no data available

11.5 Germ cell mutagenicity

no data available

11.6 Carcinogenicity

WEIGHT OF EVIDENCE CHARACTERIZATION: Classification -- D, not classifiable as to human carcinogenicity. Basis -- There are no data in humans concerning development of cancer following exposure to tributyltin oxide (TBTO). Cancer bioassays following oral exposure have been conducted in rats and mice. The bioassay in rats shows increases in benign pituitary tumors, pheochromocytomas, and parathyroid tumors at the highest doses tested. The significance of these tumors, which normally occur in this strain of rat with variable incidence, is unclear. The bioassay in mice showed no increase in tumors at any site. There are no structure-activity relationships suggesting that TBTO might be a carcinogen. Because of the questionable data from the bioassay in rats, EPA assigns TBTO to category D or to the "cannot be determined" category. HUMAN CARCINOGENICITY DATA: none

11.7 Reproductive toxicity

no data available

11.8 STOT-single exposure

no data available

11.9 STOT-repeated exposure

no data available

11.10 Aspiration hazard

no data available

12: Ecological information

12.1 Toxicity

Toxicity to fish: LC50 Pimephales promelas (fathead minnow) 2.7 ug/l/96 hr (confidence limit 2.4 - 3.0 mg/l), flow-through bioassay with measured concentrations, 24.0°C, dissolved oxygen 7.5 mg/l, hardness 51.5 mg/l calcium carbonate, alkalinity 41.1 mg/l calcium carbonate, and pH 7.5.
Toxicity to daphnia and other aquatic invertebrates: no data available
Toxicity to algae: no data available
Toxicity to microorganisms: no data available

12.2 Persistence and degradability

Tributyltin degraded with a half-life of 20 weeks in Toronto Harbor (Canada) water in the dark at 20°C; dibutyltin, monobutyltin and inorganic tin was detected as products(1). The half-life increased when the water was spiked with high levels of tributyltin (1 mg/l) presumably because the higher tin concns inhibited or killed the microorganisms(1). The half-life of tributyltin present in sediment-water mixtures was shorter than in water alone, 16 weeks at 20°C in the dark(1). Bis(tributyltin) oxide biodegrades in soil and wood by stepwise dealkylation(2). Degradation is more rapid under aerobic than anaerobic conditions(2). Degradation in wood could be due to wood rotting fungi that have been shown to degrade bis(tributyltin) oxide in pure cultures(2). The detection of small quantities of methyltributyltin in the experiments with non-sterile mixtures of Toronto Harbor (Canada) water and sediment and in water alone indicates that microorganisms are present that can methylate tributyltin(1). Half-lives as low as 6 and 7 days have been reported for incubation in water from a yacht harbor in San Diego Bay (California) in the presence of light and absence of light, respectively; at a clean water site, the respective half-lives were 9 and 19 days(3). The experimenters ruled out direct photolysis in these experiments as a cause of the increased degradation rate(3). In a marine mesocosm experiment, the biodegradation rate calculated from the gross removal rate less adsorption and volatilization transport rates was 0.08/day (half-life 9 days) at 20°C(3). Other reported degradation half-lives for tributyltin include: 5.5 mo (marine sediment); 4 mo (aerobic freshwater/sediment); 2 mo (seawater at 5 deg F); 6-19 days (estuarine waters) 6 days (freshwater at 5 deg F); 6-17 days estuarine water; 4-13 days (estuarine water)(4). Several fungi have reported to dealkylate bis(tributyltin) oxide yielding a dibutyltin compound as the primary product(5).

12.3 Bioaccumulative potential

The BCFs in crucian carp (Carassius carassius grandoculis) obtained in a 7-day experiment were 589 (muscle), 457 (vertebra); 5012 (liver); and 3162 (kidney)(1). Marine mussels bioaccumulate bis(tributyltin) oxide when it is dissolved in water or associated with phytoplankton; BCF are approximately 5000 from water and <2 from food (on a ug/g basis(2). Mantle or muscle tissue had tributyltin burdens about one third that of gills or viscera(2). Uptake was rapid, but higher when accumulation was via ingestion(2). Depuration occurred with a half-life of about 14 days(2). Neither the presence humic acids or kaolin significantly reduced accumulation(2). The different accumulation by different tissues correlate with their lipid content, suggesting that bioaccumulation is a partitioning process(2). Tributyltin was accumulated by fish at a constant rate reaching tissue concn of 1810 (muscle) and 4580 (gall bladder) expressed as bis(tributyltin) oxide but did not react a steady state concn in the 38-day experiment(3). BCFs for tributyltin in oysters ranged from 1000 (water concn 0.15 ug/l) and 5000 (water concn 1.25 ug/l)(4). In 56-day experiments, the BCF of bis(tributyultin) oxide in three marine species of fish ranged from 2400-11,000(5). The elimination rate constants ranged from 0.024 to 0.094 and the biological half-lives ranged from 7.4 to 28.8 days(5). In studies in which the bioaccumulation and elimination of tributyltin in red sea bream (Pagrus major) was by direct uptake from water, from diet, and from both simultaneously, about a quarter of the bioaccumulation was due to dietary uptake(6). The accumulation factor for dietary uptake was 0.26-0.38 on a dry wt basis(6). The elimination rate was 0.031-0.037/day and was independent of the source of uptake, water or diet(6). Bioaccumulation was also independent of the form of tributyltin in the diet(6). Marine mussels (Mytilus graynus) collected in a lightly contaminated area and transplanted to a highly contaminated area had a BCF of 10,500 for tributyltin; the half-life was 4.68 days(6). Blue mussels (Mytilus edulis) collected from a highly contaminated area and transplanted to a lightly contaminated area had a BCF of 10,400 for tributyltin; the half-life was 4.82 days(7). Oligochaetes accumulate sediment-associated tributyltin, thus making it available to bottom feeding fish(2).

12.4 Mobility in soil

No leaching of tributyltin was observed in several soils (clay, sand, topsoil and silt) during periods as long as 16 weeks(1). Tributyltin binds strongly to sediment with the distribution constant for Toronto Harbor sediment and water as 2180 at 20°C(2). Very little tributyltin or inorganic tin was released from unshaken sediment in 10 months(2). However, other studies have shown that tributyltin does not adsorb appreciably to suspended particulate matter and that it is primarily associated with the dissolved fraction of estuarine water(3,4). This is in line with the observation that addition of humic acids or kaolin clay material does not significantly affect the measured bis(tributyltin) BCF in mussels(5), suggesting that bis(tributyltin) species are only weakly bound to these materials(SRC). Studies on the adsorption of tributyltin to a wide variety of sorbents yield sorption coefficients ranging from 110 to 350,000 l/kg, but the majority of sorption coefficients are about 1,000 l/kg(6). Adsorption is relatively fast (hours) and reversible(6). In a 278-day marine mesocosm experiment, the transport rate from the water column to sediment was 0.045/day(7). The distribution coefficient between dissolved state and particulate matter calculated from data between days 2-19 was 60,000 (standard deviation 30,000)(7). Other investigators obtained distribution constants for adsorption of tributyltin to particulate matter and sediment of 3400-9300 l/kg and 200-55,000 l/kg, respectively; values were a function of sediment type and location(7). The Freundlich parameters, log k and 1/n, for tributyl tin to sediment was 1.07 and 0.359, respectively(8). In soil microcosm experiments, small bis(tributyltin) oxide releases from wood treated with the compound was observed to migrate >10 cm from the wood with 86% of the compound residing within 5 cm of the wood; none of the compound was found in any layer below 10 cm nor in groundwater at the bottom of the microcosm chamber(8). These data suggest that bis(tributyltin) oxide can strongly bind to soil and sediment but that adsorption to suspended particulate and humic matter may be much weaker(SRC).

12.5 Other adverse effects

no data available

13: Disposal considerations

13.1 Disposal methods for waste chemicals

This must be handled by a qualified unit that handles highly toxic waste, using high-temperature incineration (800-1000°C) or chemical neutralization (such as oxidative decomposition) to completely destroy the toxicity. Liquid highly toxic substances must be solidified before incineration. Those that cannot be incinerated must be stabilized/solidified before being safely landfilled.

13.2 Precautions

Disposal personnel must wear fully enclosed chemical protective suits and positive pressure respirators; waste must be strictly classified and packaged to prevent leakage; exhaust gas and wastewater generated during the disposal process must meet discharge standards; mixing with other types of waste is prohibited; and disposal records must be kept for at least 10 years for traceability.

14: Transport information

14.1 UN Number

ADR/RID: UN2788 IMDG: UN2788 IATA: UN2788

14.2 UN Proper Shipping Name

ADR/RID: ORGANOTIN COMPOUND, LIQUID, N.O.S. IMDG: ORGANOTIN COMPOUND, LIQUID, N.O.S. IATA: ORGANOTIN COMPOUND, LIQUID, N.O.S.

14.3 Transport hazard class(es)

ADR/RID: 6.1 IMDG: 6.1 IATA: 6.1

14.4 Packing group, if applicable

ADR/RID: II IMDG: II IATA: II

14.5 Environmental hazards

ADR/RID: yes IMDG: yes IATA: yes

14.6 Special precautions for user

no data available

14.7 Transport in bulk according to IMO instruments

no data available

15: Regulatory information

15.1 Safety, health and environmental regulations specific for the product in question

Chemical name	Common names and synonyms	CAS number	EC number
Tributyltin oxide	Tributyltin oxide	56-35-9	200-268-0
New Zealand Inventory of Chemicals (NZIoC)			Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)			Listed.
Vietnam National Chemical Inventory			Not Listed.
Australian Inventory of Industrial Chemicals (AIIC)			Not Listed.
Catalogue of Strictly Restricted Toxic Chemicals in China			Listed.
China Catalog of Hazardous chemicals 2015			Listed.
European INventory of Existing Commercial chemical Substances			Not Listed.
IARC Monographs on the Evaluation of Carcinogenic Risks to Humans			Not Listed.
TSCA Inventory of Chemical Substances			Listed.

16: Other information

Information on revision

SDS Creation Date	July 1, 2025
SDS Revision Date	July 1, 2025

Abbreviations and acronyms in SDS

- CAS: Chemical Abstracts Service
- ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
- RID: Regulation concerning the International Carriage of Dangerous Goods by Rail
- IMDG: International Maritime Dangerous Goods
- IATA: International Air Transportation Association
- TWA: Time Weighted Average
- STEL: Short term exposure limit
- LC50: Lethal Concentration 50%
- LD50: Lethal Dose 50%
- EC50: Effective Concentration 50%

SDS References

- IPCS - The International Chemical Safety Cards (ICSC), website: http://www.ilo.org/dyn/icsc/showcard.home
- HSDB - Hazardous Substances Data Bank, website: https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm
- IARC - International Agency for Research on Cancer, website: http://www.iarc.fr/
- eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en
- CAMEO Chemicals, website: http://cameochemicals.noaa.gov/search/simple
- ChemIDplus, website: http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp
- ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: http://www.phmsa.dot.gov/hazmat/library/erg
- Germany GESTIS-database on hazard substance, website: http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp
- ECHA - European Chemicals Agency, website: https://echa.europa.eu/

Any questions regarding this Safety Data Sheet, Please send your inquiry to sales@MolBest.com

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