Technical Safety Data Sheet for Tetrahydrofuran

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catalogue

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Part 1: Chemicals and Enterprise Labelling

Chemical Chinese name:	butylene oxide
Chemical English name:	Tetrahydrofuran
the name of firm ：	Dongying Yongxin Fine Chemical Co., Ltd.
address ：	Dongguan Village, Shicun Town, Guangrao County, Dongying City
Emergency hotline:	0532-83889090
portraiture ：	0546-6262568
zip code ：	257342
e mail address ：	13396479536@163.com
Technical specification code:	DYYX001
availability date ：	16 September 2023
Product Recommendations and Restricted Uses	It is an important organic synthetic raw material and a high-performance solvent. It is used as a solvent, chemical synthesis intermediate, and analytical reagent.

Part II: Summary of Risks

Summary of emergency: Highly flammable liquids and vapors.

GHS hazard category: According to the series of standards for chemical classification, warning labels, and precautionary statements (see Part XV), this product is classified as a flammable liquid, Category 2; severe eye injury/irritation, Category 2; carcinogenic, Category 2; specific target organ toxicity-single exposure, Category 3 (respiratory irritation).

Label elements:

figurative graph ：

Warning: Danger!

Hazard information: Highly flammable liquid and vapour; may cause respiratory irritation, may cause drowsiness or dizziness; may cause severe eye irritation;

Precaution

Precautions: Keep away from heat sources/sparks/open flames/hot surfaces; smoking is prohibited in the workplace; maintain containers in a closed state; avoid using tools that may generate sparks; implement measures to prevent electrostatic discharge; store and transport oxidizers, acids, and alkalis separately.

Response to an incident: Leak: Cut off ignition sources. Eliminate the leak source whenever possible. Prevent leakage into confined spaces.

Fire: Spray water to cool the container, and remove the container from the fire area if possible. Extinguishing agents include foam, carbon dioxide, dry powder, and sand; the use of water is strictly prohibited.

Accidental ingestion: Administer warm water, induce vomiting, and seek medical attention.

Safe storage: Keep away from heat sources and open flames; store in a cool, well-ventilated place; keep separate from oxidizers, acids, and alkalis.

Disposal: The product must be pre-treated and incinerated in a hazardous waste incinerator. Waste disposal shall comply with national and local regulations.

Physical and chemical hazards: Its vapor can form explosive mixtures with air. It is highly flammable when exposed to high heat, open flames, or strong oxidizers. Contact with air or light may produce peroxides with potential explosion risks. It reacts with acids and exhibits violent reactions with potassium hydroxide and sodium hydroxide. The vapor, being heavier than air, can disperse over long distances in low-altitude areas and may ignite and flashback upon encountering a fire source.

health hazard ： This product has irritant and anesthetic effects. Inhalation may cause irritation of the upper respiratory tract, nausea, dizziness, headache, and central nervous system depression. It can induce hepatic and renal damage. Liquid or high-concentration vapor is irritating to the eyes. Prolonged and repeated skin contact may lead to dermatitis due to depigmentation.

route of entry ： Inhalation, ingestion, and transdermal absorption.

environment hazards ： There may be hazards, with special attention to water bodies.

Explosive hazard: This product is highly flammable, and its vapor can form explosive mixtures when mixed with air.

Part III: Composition/Ingredients

harmful components	content	CASNo.
butylene oxide	99.9%	109-99-9

Part IV: First Aid Measures

skin exposure ：	Remove the contaminated clothing and wash the skin thoroughly with soap and water.
eye contact ：	Rinse the eyelids with running water or normal saline. Seek medical attention.
inhalation ：	Remove the patient immediately to a fresh air environment. Maintain airway patency. Administer oxygen if dyspnea occurs. Perform artificial respiration immediately if respiration ceases. Seek medical attention.
ingestion ：	Administer an adequate amount of warm water to induce vomiting. Seek medical attention.

Part 5: Fire Protection Measures

Hazard characteristics:	Its vapor can form explosive mixtures with air. It is highly flammable when exposed to high heat, open flames, or strong oxidizers. Contact with air or light may produce peroxides with potential explosion risks. It reacts with acids and exhibits violent reactions with potassium hydroxide and sodium hydroxide. The vapor, being heavier than air, can disperse over long distances in low-altitude areas and may ignite and flashback upon encountering a fire source.
Harmful combustion products:	Carbon monoxide, carbon dioxide.
Fire extinguishing methods and agents:	Move the water-cooled container to an open area if possible. If the container in the fire has changed color or the safety relief device is making noise, evacuate immediately. Extinguishing agents: foam, carbon dioxide, dry powder, sand.
Fire Prevention Precautions and Measures:	Emergency responders must wear self-contained positive pressure respirators and anti-static workwear. Containers in the fire scene must be evacuated immediately if discoloration occurs or sounds are produced from the safety relief valve. Water extinguishing is ineffective. Firefighters should operate from the upwind direction. Non-essential personnel must be evacuated.

Part VI: Emergency Response to Leaks

Protective measures, protective equipment, and emergency response procedures for personnel	Immediately evacuate personnel from the contaminated area to a safe zone and implement isolation with strict access restrictions. Eliminate ignition sources. Emergency responders are advised to wear self-contained positive pressure respirators and anti-static workwear. Enter the site from the upwind direction. Minimize the leakage source as much as possible. Prevent spillage into restricted spaces such as sewers or storm drains.
Environmental protection	Prevent leakage into restricted spaces such as sewers or flood discharge channels. Transfer the liquid to tankers or dedicated collectors using

measures:	explosion-proof pumps, and recover or transport it to waste disposal facilities for treatment.
Methods for containment and removal of leaked chemicals and disposal materials used:	Minor spills: Use sand or other non-flammable materials to absorb or contain the spill. Alternatively, flush with large amounts of water, dilute the wash water, and discharge it into the wastewater system. Major spills: Construct a containment dike or dig a pit to contain the spill. Apply foam to reduce vapor hazards. Spray water to cool and dilute the vapor, protect personnel, and convert the spill into a non-flammable state. Use explosion-proof pumps to transfer the material to tankers or specialized containers for recovery or transport to a waste treatment facility for disposal.

Part VII: Handling, Disposal, and Storage

Operation notes:	Perform operations in a sealed environment with full ventilation. Operators must undergo specialized training and strictly adhere to operational protocols. It is recommended that operators wear filtering respirators (half-face masks), safety goggles, anti-static workwear, and oil-resistant rubber gloves. Keep away from ignition sources and heat sources, and smoking is strictly prohibited in the workplace. Use explosion-proof ventilation systems and equipment. Prevent vapor leakage into the workplace air. Avoid contact with oxidizers, acids, and alkalis. During filling, control the flow rate and ensure grounding to prevent static electricity accumulation. Handle with care to avoid damage to packaging and containers. Equip with appropriate types and quantities of firefighting equipment and leakage emergency response devices. Empty containers may retain residual hazardous substances.
Storage precautions:	The product is typically formulated with polymerization inhibitors. Store in a cool, well-ventilated warehouse, away from ignition sources and heat. Maintain warehouse temperatures below 30°C. Ensure packaging is airtight and protected from air exposure. Store separately from oxidizers, acids, and alkalis to prevent mixing. Use explosion-proof lighting and ventilation systems. Avoid spark-producing machinery and tools. The storage area must be equipped with leak response equipment and appropriate containment materials.

Part VIII: Exposure Control and Personal Protection

exposure limit ：	Maximum Allowable Concentration (MAC, mg/m3):300.
Biological limit:	non-avaible
Monitoring method:	chromatography of gases 。
engineering control ：	The production process is enclosed with comprehensive ventilation. Safety shower and eye-wash facilities are provided.

Respiratory protection:	When exposure to its vapor is possible, a filtering facepiece respirator (FFR) should be worn. If necessary, a self-contained breathing apparatus (SCBA) is recommended.
eye protection ：	Special protection is generally not required, but safety goggles may be worn in cases of high-concentration exposure.
Skin and body protection:	Wear anti-static work clothes.
Hand protection:	Wear rubber oil-resistant gloves.
Other protections:	Smoking is strictly prohibited in the workplace. Shower and change clothes after work. Maintain personal hygiene.

Part IX: Physicochemical Properties

Appearance and characteristics:	Colorless, volatile liquid with an odor similar to ether.
pH：	non-avaible
melting point （℃）：	-108.5
Boiling point, initial boiling point, and boiling range (°C):	65.4
Relative density (water=1):	0.89
Relative vapor density (air=1):	2.5
Saturated vapor pressure (kPa):	15.20(15℃)
Combustion heat (kJ/mol):	non-avaible
critical temperatures （℃）：	268
Critical pressure (Mpa):	5.19
Logarithm of the octanol/water partition coefficient:	non-avaible
flash point （℃）：	-20
ignition temperature （℃）：	230
Explosion limit% (V/V):	12.4
Lower explosive limit (V/V):	1.5
inflammability ：	highly flammable

solubility ：	Soluble in water, ethanol, ether, acetone, benzene, and most organic solvents.

Part 10: Stability and Reactivity

stability ：	stabilize 。
Incompatible compounds:	Acids, alkalis, strong oxidizing agents.
Conditions to avoid contact:	air, open flame, high heat.
Aggregation hazard:	Not aggregated.
Adverse reactions:	It is highly flammable when exposed to strong oxidizing agents. Reacts violently with potassium hydroxide and sodium hydroxide.
Hazardous decomposition products:	Carbon monoxide, carbon dioxide.

Part XI: Toxicological Data

acute toxicity ：	Belongs to the low-toxicity category. In rats, eye and respiratory tract irritation symptoms may occur at an inhalation concentration of 590 mg/m³; these symptoms are significantly exacerbated at 14,750 mg/m³. LD50:1,650 mg/kg (oral administration in rats); LC50:61,740 mg/m³, 3 hours (inhalation in rats).
Skin irritation or corrosion:	It is irritating to the skin, and prolonged repeated exposure may lead to dermatitis due to its depilatory effect.
Eye irritation or corrosion:	Liquid or high-concentration vapor is irritating to the eyes. In rats, inhalation of 590 mg/m3 for 3 hours resulted in eyelid erythema.
Respiratory or skin allergy:	Inhalation causes irritation of the upper respiratory tract.
Mutability of germ cells:	non-avaible
carcinogenicity ：	Category 2
genotoxicity ：	non-avaible
Specific target organ system	may cause respiratory tract irritation

toxicity—single exposure:	
Specific target organ system toxicity—repeated exposure:	non-avaible
inhalation hazard ：	Inhalation may cause upper respiratory tract irritation, nausea, dizziness, headache, and central nervous system depression.

Part XII: Ecological Data

Ecotoxicity:	non-avaible 。
Persistence and degradability:	Half-inhibition concentration (IC50):225 mg/L/72h (algae).
Potential for bioaccumulation:	non-avaible 。
Soil mobility:	non-avaible 。
Other adverse effects:	The substance may be hazardous to the environment, and special attention should be paid to water bodies.

Part XIII: Disposal of Waste

Waste properties:	hazardous wastes
Disposal method:	Product: It must be pre-treated before being incinerated in a hazardous waste incinerator. Dirty packaging: return empty containers to the manufacturer or dispose of them according to national and local regulations.
Precautions for disposal:	Waste storage and disposal should be in accordance with and strictly comply with national and local regulations.

Part XIV: Transport Information

UN Hazardous Materials Code (UN):	2056
UN Transport Name:	butylene oxide
UN Hazard Classification:	Category 3
Package category:	Ⅱ

packing mark ：	flammable liquid
packing method ：	Small-mouthed steel drums; ordinary wooden crates for ampoules; threaded-mouth glass bottles, iron-capped press-fitting glass bottles, plastic bottles or metal drums (cans) in ordinary wooden crates.
marine pollutants ：	deny
Transportation precautions:	Transportation vehicles must be equipped with appropriate types and quantities of firefighting equipment and spill emergency response devices. During summer, morning and evening hours are preferable for transportation. Tankers used in transportation should be fitted with grounding chains, and perforated partitions may be installed inside to minimize static electricity generated by vibrations. Mixing with oxidizers, acids, alkalis, or food-grade chemicals is strictly prohibited. During transit, vehicles must be protected from direct sunlight, rain, and high temperatures. When making stops, vehicles should remain away from ignition sources, heat sources, and high-temperature areas. Exhaust pipes of vehicles transporting these materials must be equipped with flame arresters, and the use of machinery or tools that may produce sparks is forbidden during loading and unloading. For road transport, vehicles must follow designated routes and avoid stopping in residential or densely populated areas. Railway transport prohibits shunting. Bulk transportation using wooden or cement boats is strictly prohibited.

Part XV: Regulatory Information

Legal information:	The following laws, regulations, and standards provide corresponding provisions for the safe use, production, storage, transportation, classification, and labeling of chemical hazardous materials. The Law of the People's Republic of China on Work Safety (November 1, 2002); Regulations on the Safety Management of Hazardous Chemicals (State Council Decree No.591); The "Series of Standard Specifications for Classification and Labeling of Chemicals" (GB30000.1-GB30000.29); List of Dangerous Goods (GB12268-2012): Included. The substance is classified as a Class 3.1 low-flammability liquid.

Part XVI: Other Information

References ：	Comprehensive Handbook of Hazardous Chemicals Safety (2nd Edition). Chemical Industry Press (2008); New Edition of the Handbook of Hazardous Chemicals
Last updated:	16 September 2023
organization unit ：	Dongying Yongxin Fine Chemical Co., Ltd.

revision note ：	Fifth Edition
disclaimer ：	Dongying Yongxin Fine Chemical Co., Ltd. has provided comprehensive and accurate information in this Safety Data Sheet (SDS). We recommend that all users/clients carefully review this safety technical specification, though we cannot guarantee its absolute comprehensiveness or precision. This SDS is intended solely for appropriately trained personnel handling the product, providing safety precautions. Users must independently assess the SDS' applicability under specific conditions. Dongying Yongxin Fine Chemical Co., Ltd. shall not be held liable for any losses or injuries resulting from the use of this SDS in exceptional circumstances.