



## Safety Data Sheet

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### Section 1. Identification of the substance/mixture and of the company/undertaking

Product identifier:

Product name: Tri-n-butyl phosphate

SDS No. : 7972E-3

Relevant identified uses of the substance or mixture and uses advised against

Research and Development

Details of the supplier of the safety data sheet

Manufacturer/Supplier: KISHIDA CHEMICAL CO., LTD.

Address: 3-1, Honmachibashi, Chuo-ku, Osaka, JAPAN

Division: Chemical Safety Management Department

Telephone number: +81-6-6946-8061

FAX: +81-6-6946-1607

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### Section 2. Hazards identification

GHS classification and label elements of the product

Classification of the substance or mixture

#### HEALTH HAZARDS

Acute toxicity (Oral): Category 4

Acute toxicity (Inhalation): Category 4

Skin corrosion/irritation: Category 2

Serious eye damage/eye irritation: Category 1

Carcinogenicity: Category 2

Specific target organ toxicity – single exposure: Category 2 (respiratory system)

Specific target organ toxicity – repeated exposure: Category 2 (nervous system, urinary bladder)

#### ENVIRONMENT HAZARDS

Hazardous to the aquatic environment, short-term (acute): Category 2

Hazardous to the aquatic environment, long-term (chronic): Category 2

(Note) GHS classification without description: Not classified/Classification not possible

Label elements



Signal word: Danger

#### HAZARD STATEMENT

H302 Harmful if swallowed

H332 Harmful if inhaled

H315 Causes skin irritation

H318 Causes serious eye damage

H351 Suspected of causing cancer

H371 May cause damage to organs (respiratory system)

H373 May cause damage to organs through prolonged or repeated exposure (nervous system, urinary bladder)

H411 Toxic to aquatic life with long lasting effects

**PRECAUTIONARY STATEMENT****Prevention**

- P202 Do not handle until all safety precautions have been read and understood.
- P273 Avoid release to the environment.
- P260 Do not breathe dust/fume/gas/mist/vapors/spray.
- P271 Use only outdoors or in a well-ventilated area.
- P264 Wash contaminated parts thoroughly after handling.
- P280 Wear protective gloves.
- P280 Wear eye protection/face protection.
- P280 Use personal protective equipment as required.
- P270 Do not eat, drink or smoke when using this product.

**Response**

- P391 Collect spillage.
- P314 Get medical advice/attention if you feel unwell.
- P308 + P313 IF exposed or concerned: Get medical advice/attention.
- P310 Immediately call a POISON CENTER/doctor/physician.
- P312 Call a POISON CENTER/doctor/physician if you feel unwell.
- P308 + P311 IF exposed or concerned: Call a POISON CENTER/doctor/physician.
- P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
- P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
- P332 + P313 If skin irritation occurs: Get medical advice/attention.
- P362 + P364 Take off contaminated clothing and wash it before reuse.
- P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P330 IF SWALLOWED: Rinse mouth.
- P301 + P312 IF SWALLOWED: Call a POISON CENTER/doctor/physician if you feel unwell.

**Storage**

- P405 Store locked up.

**Disposal**

- P501 Dispose of contents/container in accordance with local/national regulation.

**Specific adverse human health effects**

See "11. Toxicological Information".

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**Section 3. Composition/information on ingredients**

Mixture/Substance selection:

Substance

Ingredient name	Content (%)	CAS No.	ENCS	Chemical formula
Tri-n-butyl phosphate	99(min)	126-73-8	2-2021; 2-2000	[CH <sub>3</sub> (CH <sub>2</sub> ) <sub>3</sub> O] <sub>3</sub> PO

Note : The figures shown above are not the specifications of the product.

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**Section 4. First-aid measures**

Descriptions of first-aid measures

General measures

Get medical advice/attention if you feel unwell.

IF INHALED

Remove person to fresh air and keep comfortable for breathing.



Call a POISON CENTER/doctor/physician if you feel unwell.

**IF ON SKIN**

Take off immediately all contaminated clothing. Rinse skin with water or shower.

Wash with plenty of soap and water.

If skin irritation or rash occurs: Get medical advice/attention.

**IF IN EYES**

Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

If eye irritation persists: Get medical advice/attention.

**IF SWALLOWED**

Rinse mouth.

Call a POISON CENTER/doctor/physician if you feel unwell.

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**Section 5. Fire-fighting measures****Extinguishing media****Suitable extinguishing media**

Use appropriate extinguishing media suitable for surrounding facilities.

In case of fire, use spraying loaded liquid, foam (water-soluble liquid: alcohol-resistant foam), inactive gases, dry powder, dry sand to extinguish.

\*Fire Service Act Group 4 Hazardous Materials

**Unsuitable extinguishing media**

Indoor Fire Plug System or Outdoor Fire Plug System

Sprinkler System

Dry Chemical Extinguishing System—Others (except for phosphates etc., Hydrogen Carbonates etc.)

Fire Extinguisher Discharging Jet Water/Spraying Water

Fire Extinguisher Discharging Jet Loaded Liquid

Fire Extinguisher Discharging Dry Extinguishing agents—Others (except for phosphates etc., Hydrogen Carbonates etc.)

Water Bucket or Water Tank

\*Cabinet Order Concerning the Control of Hazardous Materials (Attached Table 5) Group 4 Hazardous Materials

**Specific hazards arising from the substance or mixture**

Fire may produce irritating, corrosive and/or toxic gases.

Runoff from fire control or dilution water may cause pollution.

See "10.Stability and Reactivity".

**Advice for firefighters****Specific fire-fighting measures**

Evacuate non-essential personnel to safe area.

**Special protective equipment and precautions for fire-fighters**

Wear fire resistant or flame retardant clothing.

Wear protective gloves/protective clothing/eye protection/face protection.

Firefighters should wear self-contained breathing apparatus with a full facepiece operated in the positive pressure mode.

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**Section 6. Accidental release measures****Personnel precautions, protective equipment and emergency procedures**

Keep unauthorized personnel away.



Ventilate area until material pick up is complete.

Wear proper protective equipment.

Environmental precautions

Prevent spills from entering sewers, watercourses, low areas or rivers. To be careful not discharged to the environment without being properly handled waste water contaminated.

Methods and materials for containment and cleaning up

Absorb spill with inert material (dry sand, earth, et al), then place in a chemical waste container.

Preventive measures for secondary accident

Collect spillage.

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## Section 7. Handling and storage

### Precautions for safe handling

#### Preventive measures

(Exposure Control for handling personnel)

Do not breathe dust/fume/gas/mist/vapors/spray.

(Protective measures against fire and explosion)

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

(Exhaust/ventilator)

Exhaust/ventilator should be available.

(Safety treatments)

Avoid contact with skin.

Avoid contact with eyes.

#### Safety Measures

Do not handle until all safety precautions have been read and understood.

Use only outdoors or in a well-ventilated area.

Wear protective gloves/protective clothing/eye protection/face protection.

Wash hands et al thoroughly after handling.

When using do not eat, drink or smoke.

#### Any incompatibilities

See "10.Stability and Reactivity".

#### Advice on general occupational hygiene

Wash contaminated parts thoroughly after handling.

Do not eat, drink or smoke when using this product.

Take off contaminated clothing and wash it before reuse.

### Storage

#### Conditions for safe storage

Keep container tightly closed.

Store locked up. (P405)

Store in a cool, dry place. Do not store in direct sunlight.

Storage in accordance with local/national regulation.

#### Container and packaging materials for safe handling

Use closed unbreakable containers.

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## Section 8. Exposure controls/personal protection

### Control parameters

Control value and concentration standard value are not available in ISHA.

**Adopted value**

ACGIH(2013) TWA: 5 mg/m<sup>3</sup>(IFV) (Bladder; eye & URT irr)

**Exposure controls****Appropriate engineering controls**

Do not use in areas without adequate ventilation.

Eye wash station should be available.

Washing facilities should be available.

**Individual protection measures**

Recommend to use protective equipment in conformity with the standards.

Use appropriate protective equipment in accordance with local/national regulation.

**Respiratory protection**

Wear respiratory protection (dust-proof mask/gas mask). Select chemical cartridge corresponding to type of gases when using a gas mask.

**Hand protection**

Wear impervious protective glove.

**Eye protection**

Wear eye/face protection. Wear safety goggles in cases gas is generated.

**Skin and body protection**

Wear protective clothing.

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**Section 9. Physical and Chemical Properties****Information on basic physical and chemical properties**

Physical state: Liquid

Color: Colorless

Odor: Odorless to slightly characteristic odor

Melting point/Freezing point: <-80°C

Boiling point or initial boiling point: (Tri-n-butyl phosphate)289°C

Boiling range data is not available.

Flammability (gases, liquids and solids) data is not available.

Lower and upper explosion limit/flammability limit data is not available.

Flash point: (Tri-n-butyl phosphate)(O.C.) 146°C

Auto-ignition temperature: (Tri-n-butyl phosphate)>482°C

Decomposition temperature data is not available.

pH data is not available.

Kinematic viscosity data is not available.

**Solubility:**

Solubility in water: Poor

Solubility in solvent data is not available.

n-Octanol/water partition coefficient: log Pow4

Vapor pressure: 0.15 Pa (25°C)

Density and/or relative density: 0.98

Relative vapor density (Air=1): 9.2

Particle characteristics data is not available.

**Other information**

Other information is not available.

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**Section 10. Stability and Reactivity****Reactivity**



Not available.

Chemical stability

Stable under normal storage/handling conditions.

Possibility of hazardous reactions

Decomposes on burning. This produces toxic fumes including phosphorus oxides. Reacts with warm water. This produces corrosive phosphoric acid and butanol. Attacks some forms of plastic, rubber and coatings. Reacts with bases and strong oxidants. (ICSC 0584)

Conditions to avoid

Contact with incompatible materials.

Contact with fire source.

Incompatible materials

Bases, Strong oxidizing agents, Warm water

Hazardous decomposition products

Carbon oxides, Phosphorus oxides, Phosphoric acid, Butanol

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## Section 11. Toxicological Information

### Information on toxicological effects

#### Acute toxicity

##### Acute toxicity (Oral)

###### [Product]

Category 4, Harmful if swallowed

###### [Data for components of the product]

[GHS Cat. Japan, base data]

rat LD50=1400mg/kg (ATSDR, 2012)

##### Acute toxicity (Dermal)

###### [Data for components of the product]

[GHS Cat. Japan, base data]

rabbit LD50 >3100mg/kg (ACGIH 7th, 2001)

##### Acute toxicity (Inhalation)

###### [Product]

Category 4, Harmful if inhaled

###### [Data for components of the product]

[GHS Cat. Japan, base data]

mist: rat LC50=123ppm/6hr (cal.: 2.01mg/L/4hr) (ACGIH 7th, 2001)

#### Irritant properties

##### Skin corrosion/irritation

###### [Product]

Category 2, Causes skin irritation

###### [Data for components of the product]

[GHS Cat. Japan, base data]

rabbit mild irritation (OECD TG404) (DFGOT vol.17, 2002)

##### Serious eye damage/irritation

###### [Product]

Category 1, Causes serious eye damage

###### [Data for components of the product]

[GHS Cat. Japan, base data]

rabbit necrosis (ATSDR, 2012)

Allergenic and sensitizing effects data is not available.

Mutagenic effects data is not available.

**Carcinogenicity**

[Product]

Category 2, Suspected of causing cancer

[Data for components of the product]

[GHS Cat. Japan, base data]

cat.2; EU Carc.2 (EU CLP, Access on Aug. 2019)

[ACGIH]

A3(2013) : Confirmed Animal Carcinogen with Unknown Relevance to Humans

[EU]

Category 2; Substances suspected human carcinogens

Reproductive toxicity data is not available.

**Specific target organ toxicity (STOT)**

STOT-single exposure

[Product]

Category 2, May cause damage to organs

[Data for components of the product]

[cat.2]

[GHS Cat. Japan, base data]

respiratory system (SIDS, 2004; DFGOT vol.17, 2002)

STOT-repeated exposure

[Product]

Category 2, May cause damage to organs through prolonged or repeated exposure

[Data for components of the product]

[cat.2]

[GHS Cat. Japan, base data]

nervous system, urinary bladder (DFGOT vol.17, 2002 et al.)

Aspiration hazard data is not available.

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**Section 12. Ecological Information****Toxicity****Aquatic toxicity**

[Product]

Category 2, Toxic to aquatic life

Category 2, Toxic to aquatic life with long lasting effects

[Data for components of the product]

Hazardous to the aquatic environment, short-term (acute)

[GHS Cat. Japan, base data]

Crustacea (*Gammarus pseudolimnaeus*) LC50=1.7mg/L/96hr (NITE Initial Risk Assessment, 2008)

Hazardous to the aquatic environment, long-term (chronic)

[GHS Cat. Japan, base data]

Fish (*Oncorhynchus mykiss*) NOEC=0.82mg/L/95days (NITE Initial Risk Assessment, 2008)**Water solubility**

poor (ICSC, 2005)

**Persistence and degradability**

[Data for components of the product]

Not rapidly degradable (BOD\_Degradation : 0% (METI existing chemical safety inspections, 1980))

**Bioaccumulative potential**

[Data for components of the product]



log Pow=4.0 (ICSC, 2005); BCF=20 (Check & Review, Japan)

Mobility in soil

Mobility in soil data is not available.

Other adverse effects

Ozone depleting chemical data is not available.

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### Section 13. Disposal considerations

Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging

Waste treatment methods

Avoid release to the environment.

Dispose of contents/container as industrial waste. Accordance with local/national regulation.

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### Section 14. Transport Information

UN Number or ID Number : 3082

UN Proper Shipping Name :

ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

Class or division (Transport hazard class) : 9

Packing group : III

ERG GUIDE No.: 171

IMDG Code (International Maritime Dangerous Goods Regulations)

UN Number or ID Number : 3082

UN Proper Shipping Name :

ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

Class or division (Transport hazard class) : 9

Packing group : III

IATA (Dangerous Goods Regulations)

UN Number or ID Number : 3082

UN Proper Shipping Name :

ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

Class or division (Transport hazard class) : 9

Hazard labels : Miscellaneous & Environmentally hazardous

Packing group : III

Environmental hazards

Marine pollutants (yes/no) : yes

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### Section 15. Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture

U.S. Toxic Substances Control Act (TSCA) Inventory

Chemicals listed in TSCA Inventory

Applicable

Other regulatory information

Ensure this material in compliance with federal requirements and ensure conformity to local regulations.





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**Section 16. Other information**

## References and sources for data

Globally Harmonized System of classification and labelling of chemicals, UN  
Recommendations on the TRANSPORT OF DANGEROUS GOODS 22nd edit., 2021 UN  
IMDG Code, 2022 Edition (Incorporating Amendment 41-22)  
IATA Dangerous Goods Regulations (65th Edition) 2024  
2020 EMERGENCY RESPONSE GUIDEBOOK (US DOT)  
2024 TLVs and BEIs. (ACGIH)  
JIS Z 7252 : 2019  
JIS Z 7253 : 2019  
2023 Recommendation on TLVs (JISOH)  
Supplier's data/information

## General Disclaimer

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Unauthorized translation or modification is prohibited.

Please provide SDS to customers for selling or transferring.

All chemicals have unknown hazard. Handle the product with care.

This data sheet was created based on the information we currently have and may be revised according to new information. In addition, the precautions apply only to normal handling, and in the case of special handling, please make adequate countermeasure to maintain your safety.

The data given here is based on current knowledge and experience. The purpose of this Safety Data Sheet is to describe the products in terms of their safety requirements. The data does not signify any warranty with regard to the products' properties.

The GHS classification data given here is based on current Japan official data (NITE published in 2022).