
Safety Data Sheet

1. Chemical product and company identification

Product name : 1,4-Dioxane

SDS code : H4-01

Company/undertaking identification :

HAYASHI PURE CHEMICAL IND.,LTD.

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Emergency number : 06-6910-7305




Recommended use : For research and experimental use only.

Restrictions on use : Do not use on a human body or for animal medicines, foods, household products, cosmetics, etc.

2. Hazards identification

GHS classification

| | | | |
|--|--|---------------------------------|-------------------|
| Physical hazards | Explosives | No classification | |
| | Flammable gases | No classification | |
| | Aerosol | No classification | |
| | Oxidizing gases | No classification | |
| | Gases under pressure | No classification | |
| | Flammable liquids | Category 2 | |
| | Flammable solids | No classification | |
| | Self-reactive substances and mixtures | No classification | |
| | Pyrophoric liquids | No classification | |
| | Pyrophoric solids | No classification | |
| | Self-heating substances and mixtures | classification not possible | |
| | Substances and mixtures which in contact with water emit flammable gases | No classification | |
| | Oxidizing liquids | No classification | |
| | Oxidizing solids | No classification | |
| | Organic peroxides | No classification | |
| | Corrosive to metals | classification not possible | |
| | Desensitized explosives | classification not possible | |
| | Health hazards | Acute toxicity (oral) | No classification |
| | | Acute toxicity (dermal) | No classification |
| | | Acute toxicity (inhalation:gas) | No classification |
| Acute toxicity (inhalation:vapors) | | Category 4 | |
| Acute toxicity (inhalation:dust/mist) | | classification not possible | |
| Skin corrosion/irritation | | Category 2 | |
| Serious eye damage/eye irritation | | Category 2A | |
| Respiratory sensitization | | classification not possible | |
| Skin sensitization | | classification not possible | |
| Germ cell mutagenicity | | No classification | |
| Carcinogenicity | Category 1B | | |
| Reproductive toxicity | classification not possible | | |
| Specific target organ toxicity (single exposure) | Category 1 (central nervous system) | | |

| | | |
|-----------------------------------|---|---|
| | Specific target organ toxicity (single exposure) | Category 3 (Narcosis) |
| | Specific target organ toxicity (single exposure) | Category 3 (Respiratory tract irritation.) |
| | Specific target organ toxicity (repeated exposure) | Category 1 (kidneys, liver, central nervous system) |
| | Specific target organ toxicity (repeated exposure) | Category 2 (respiratory system) |
| | Aspiration hazard | classification not possible |
| Environmental hazards | Hazardous to the aquatic environment, short-term (acute) | No classification |
| | Hazardous to the aquatic environment, long-term (chronic) | No classification |
| | Hazardous to the ozone layer | classification not possible |
| Hazard pictograms (GHS JP) |    | |
| | GHS02 | GHS07 |
| Signal word (GHS JP) | : | Danger |
| Hazard statements (GHS JP) | : | <p>Highly flammable liquid and vapor (H225)</p> <p>Causes skin irritation (H315)</p> <p>Causes serious eye irritation (H319)</p> <p>Harmful if inhaled (H332)</p> <p>May cause respiratory irritation (H335)</p> <p>May cause drowsiness or dizziness (H336)</p> <p>May cause cancer (H350)</p> <p>Causes damage to organs (central nervous system) (H370)</p> <p>Causes damage to organs (kidneys, liver, central nervous system) through prolonged or repeated exposure (H372)</p> <p>May cause damage to organs (respiratory system) through prolonged or repeated exposure (H373)</p> |
| Precautionary statements (GHS JP) | | |
| Prevention | : | <p>Obtain special instructions before use. (P201)</p> <p>Do not handle until all safety precautions have been read and understood. (P202)</p> <p>Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. (P210)</p> <p>Ground and bond container and receiving equipment. (P240)</p> <p>Use explosion-proof electrical/ventilating/lighting equipment. (P241)</p> <p>Use only non-sparking tools. (P242)</p> <p>Take action to prevent static discharges. (P243)</p> <p>Do not breathe dust/fume/gas/mist/vapors/spray. (P260)</p> <p>Wash hands, forearms and face thoroughly after handling. (P264)</p> <p>Do not eat, drink or smoke when using this product. (P270)</p> <p>Use only outdoors or in a well-ventilated area. (P271)</p> <p>Wear protective gloves/protective clothing/eye protection/face protection. (P280)</p> |
| Response | : | <p>IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. (P303+P361+P353)</p> <p>IF INHALED: Remove person to fresh air and keep comfortable for breathing (P304+P340)</p> <p>IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. (P305+P351+P338)</p> <p>IF exposed or concerned: Call a POISON CENTER or doctor. (P308+P311)</p> <p>Get medical advice/attention if you feel unwell. (P314)</p> <p>If skin irritation occurs: Get medical advice/attention. (P332+P313)</p> <p>If eye irritation persists: Get medical advice/attention. (P337+P313)</p> <p>Take off contaminated clothing and wash it before reuse. (P362+P364)</p> <p>In case of fire: Use specify appropriate media to extinguish. (P370+P378)</p> |
| Storage | : | Store in a well-ventilated place. Keep container tightly closed. (P403+P233) |

Store in a well-ventilated place. Keep cool. (P403+P235)
Store locked up. (P405)

Disposal : Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation. (P501)

3. Composition/information on ingredients

Distinction of substance or mixture : Substance

| Name | Concentration or Concentration range | Formula | Kanpo number | | CAS RN |
|-------------|--------------------------------------|---------|--------------|-----------------------------|----------|
| | | | CSCL no | ISHL no | |
| 1,4-Dioxane | ≥99.0%、≤100% | C4H8O2 | (5)-839 | Existing Chemical Substance | 123-91-1 |

The above concentration or concentration range are not product specification.
All percentages listed in the above concentration or concentration range are wt%, unless otherwise specified.

4. First aid measures

First aid measures

First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing.
Get immediate medical advice/attention.

First-aid measures after skin contact : Remove/Take off immediately all contaminated clothing.
Gently wash with plenty of soap and water.
Get immediate medical advice/attention.

First-aid measures after eye contact : IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Get immediate medical advice/attention.

First-aid measures after ingestion : Do NOT induce vomiting.
Rinse mouth.
Get immediate medical advice/attention.

5. Fire fighting measures

Suitable extinguishing media : Water spray, Alcohol-resistant foam, Dry powder, Carbon dioxide, Sand.

Unsuitable extinguishing media : Do not use a heavy water stream.

Fire hazard : Extremely flammable liquid and vapor.

Explosion hazard : Danger of the steam explosion in indoor, outdoor, sewer.
May induce explosion of containers by heating.

Hazardous decomposition products in case of fire : In case of fire, product may produce irritative or toxic fumes/gases.

Firefighting instructions : If ignited, for the initial fire-fighting, cut off combustion sources, extinguish fire at a stroke using appropriate fire-extinguishers.
In the case of peripheral fire, quickly remove movable containers to safe places.
If unable to be moved containers, sprinkle water to containers and surrounding equipment, etc. to cool.
Even after extinguishing fire, thoroughly cool containers by using plenty of water.

Protection during firefighting : Wear appropriate fire-resistant clothing including self contained-compressed air breathing apparatus.

6. Accidental release measures

Personal Precautions, Protective Equipment and Emergency Procedures

General measures : Before entering, ventilate the area.
Do not let unauthorized persons come close to the area.
Immediately place the leakage area in isolation, with taking proper distances for all directions.
Wear appropriate personal protective devices to prevent inhalation and contact with eye, skin, and clothing, and never attempt to work on the lee.

Environmental precautions

Environmental precautions : Avoid release to the environment.
Prevent entry to sewers and public waters.

Methods and Equipment for Containment and Cleaning up

Methods for cleaning up : Clean up any spills as soon as possible, using an absorbent material to collect it.
Collect leaking and spilled liquid in sealable containers as far as possible.
Wash out the spilled area with large amounts of water.

7. Handling and storage**Handling**

Technical measures : Work with appropriate personal protective equipment to prevent inhalation or contact to eyes, skin, and clothing.
Handle with care to prevent leakage, overflowing, or scattering, minimize generation of mist or vapor, and thoroughly ventilate.

Precautions for safe handling : Do not eat, drink or smoke when using this product.
Thoroughly wash your hands and gargle after handling.
Ensure good ventilation of the work station.
Do not contact, breathe or swallow.
Take precautionary measures against static discharge.
Use explosion-proof equipment.

Prevents handling of incompatible substances or mixtures : Avoid prolonged or repeated exposure.

Storage

Storage conditions : Store locked up.
Store in a well-ventilated place, away from direct sunlight. Keep container tightly closed and keep away from fire and heat sources.

Material used in packaging/containers : Light shielding airtight container.

Technical measures : Comply with applicable regulations.

Storage temperature : Cool and dark place

8. Exposure controls / Personal protection equipment

| Component name | Administration level (MHLW) | Exposure limits (JSOH) | |
|----------------|-----------------------------|--------------------------------|------------|
| | | Standard Value | JSOH OEL C |
| 1,4-Dioxane | 10 ppm | 3.6 mg/m ³ 1 ppm | - |

Appropriate engineering controls : Cover up tightly the generation source at the handling place or install local exhaust equipment or overall ventilation equipment. Install safety showers and eye-fountains near a handling place. Clearly indicate the location.

Protective equipment

Respiratory protection : Gas mask for organic gases

Hand protection : Impervious protective gloves

Eye protection : Protective glasses (general glasses, glasses with side-shields, goggles)

Skin and body protection : Impervious aprons, Impervious work clothing, Impervious long boots

9. Physical and chemical properties

Physical state : Liquid

Appearance : Liquid

Color : colorless transparent

Odor : characteristic odor

pH : No data available

Melting point : 12 °C

Freezing point : No data available

Boiling point : 101.1 °C

| | |
|---|--|
| Flash point | : 12 °C (tag closed cup) |
| Auto-ignition temperature | : 180 °C |
| Decomposition temperature | : No data available |
| Flammability | : No data available |
| Vapor pressure | : 4.1 kPa (20°C) |
| Relative density | : No data available |
| Density | : 1.03 – 1.04 g/cm ³ (20°C) |
| Relative gas density | : No data available |
| Solubility | : Easily soluble in water. Soluble in ethanol. Soluble in diethyl ether. Soluble in many organic solvents. |
| Partition coefficient n-octanol/water (Log Pow) | : No data available |
| Explosive limits (vol %) | : 2 – 22.5 vol % |
| Viscosity, kinematic | : No data available |
| Particle characteristics | : No data available |

10. Stability and reactivity

| | |
|------------------------------------|--|
| Reactivity | : No data available |
| Chemical stability | : Stable under normal handling conditions. Dangerous peroxides may be generated if left in the air, so care must be taken in the distillation/evaporation operation. |
| Possibility of hazardous reactions | : Reacts violently with oxidizing agents and strong acids. Corrodes many kinds of plastics. Explosively reacts with certain catalysts (e.g., Raney nickel at 120°C or higher). |
| Conditions to avoid | : Sunlight, heat. Ignition sources such as spark, flame and static electricity. Contact with oxidizing agents and strong acids. |
| Incompatible materials | : Oxidizing agents, Strong acids |
| Hazardous decomposition products | : No data available |

11. Toxicological information

The information in this section is based on the "GHS Classification Results" by NITE.

| 1,4-Dioxane | |
|---------------------------------------|---|
| Acute toxicity (oral) | No classification |
| Acute toxicity (dermal) | No classification |
| Acute toxicity (gas) | No classification |
| Acute toxicity (vapour) | Category 4 |
| Acute toxicity (inhalation:dust/mist) | classification not possible |
| Skin corrosion/irritation | Category 2 |
| Serious eye damage/irritation | Category 2A |
| Respiratory sensitization | classification not possible |
| Skin sensitization | classification not possible |
| Germ cell mutagenicity | No classification |
| Carcinogenicity | Category 1B |
| Reproductive toxicity | classification not possible |
| STOT-single exposure | Category 1 Category 3 (Narcosis) Category 3 (Respiratory tract irritation.) |
| STOT-repeated exposure | Category 1 Category 2 |
| Aspiration hazard | classification not possible |

12. Ecological information

The information in this section is based on the "GHS Classification Results" by NITE.

| 1,4-Dioxane | |
|---|-------------------|
| Hazardous to Aquatic Environment - Acute Hazard | No classification |
| Hazardous to Aquatic Environment - Chronic Hazard | No classification |

| 1,4-Dioxane | |
|-------------------------------|-----------------------------|
| Persistence and degradability | No data available |
| Bioaccumulative potential | No data available |
| Mobility in soil | No data available |
| Hazardous to the ozone layer | classification not possible |

13. Disposal considerations

- Ecology - waste materials : With the detail information of the waste, subcontract its disposal to a waste disposer authorized by a Prefectural Governor.
- Contaminated container and packaging : Empty the packaging completely prior to disposal.
Empty containers should be taken for recycle, recovery or waste in accordance with local regulation.

14. Transport information

International Regulations

Transport by sea(IMDG)

- UN-No. (IMDG) : 1165
 Proper Shipping Name (IMDG) : DIOXANE
 Packing group (IMDG) : II
 Transport hazard class(es) (IMDG) : 3
 Hazard labels (IMDG) : 3
 Class (IMDG) : 3
 Limited quantities (IMDG) : 1 L
 Excepted quantities (IMDG) : E2
 Packing instructions (IMDG) : P001
 IBC packing instructions (IMDG) : IBC02
 Tank instructions (IMDG) : T4
 Tank special provisions (IMDG) : TP1
 Stowage category (IMDG) : B
 Flash point (IMDG) : 12°C c.c.
 Properties and observations (IMDG) : Colourless liquid with an ether-like odour. Flashpoint: 12°C c.c.
 Explosive limits: 2% to 22%. Miscible with water. Harmful by inhalation.
- MFAG-No : 127

Air transport(IATA)

- UN-No. (IATA) : 1165
 Proper Shipping Name (IATA) : Dioxane
 Packing group (IATA) : II
 Transport hazard class(es) (IATA) : 3
 Hazard labels (IATA) : 3
 Class (IATA) : 3
 PCA Excepted quantities (IATA) : E2
 PCA Limited quantities (IATA) : Y341
 PCA limited quantity max net quantity (IATA) : 1L
 PCA packing instructions (IATA) : 353
 PCA max net quantity (IATA) : 5L
 CAO packing instructions (IATA) : 364
 CAO max net quantity (IATA) : 60L
 ERG code (IATA) : 3L

Marine pollutant : Not applicable

Regulations in Japan

- Regulatory information by sea : Conform to the provisions of the Ship Safety Law.
 Regulatory information by air : Conform to the provisions of the Civil Aeronautics Law.
 MFAG-No : 127

Special transport precautions : When transporting, load containers so that they do not tip over, damage, drop or collapse. Make sure there is no leak in containers.

15. Regulatory information

National law

| | | |
|---|---|--|
| Chemical Substances Control Law | : | Priority Assessment Chemical Substances (Law Article 2, Para.5) |
| Industrial Safety and Health Law | : | Group 2 Specified Chemical Substance, Special Organic Solvents (Ordinance on Prevention of Hazards Due to Specified Chemical Substances Art.2 Para.1, Items 2, 3-2, 3-3) Working Environment Evaluation Standards, Administrative Control Levels (Law Art.65-2, Para.1) Harmful Substances Whose Names Are to be Indicated on the Label (Law Art.57, Para.1, Enforcement Order Art.18) Dangerous or Harmful Substances for Notification of Chemical Name etc. on SDS (Law Art.57-2, Enforcement Order Art.18-2) 1,4-Dioxane Dangerous Substances - Flammable Substance (Enforcement Order Attached Table 1 Item 4) Published Substances of the Guidelines for Preventing the Impairment of Workers' Health (Act, Art.28, Para.3, MHLW Noticed Guideline) Specified Chemical Substances, Special Control Substances (Ordinance on Prevention of Hazards Due to Specified Chemical Substances Art.38-3) Substances on Special medical examination, Current handling workers (Act, Art.66, Para.2, Enforcement Order, Art.22 Item 1) Substances that must be used in impermeable protective equipment based on special regulations (List of substances applicable to No. 0704 Item 1, 5 based on July 4, 2023) |
| Japanese Poisonous and Deleterious Substances Control Law | : | Not applicable |
| Water Pollution Prevention Law | : | Hazardous Substances (Act, Art.2, Enforcement Order Art.2, Ministerial Ordinance to Provide for Effluent Standards, Art.1) |
| Fire Service Law | : | Group 4 - Flammable liquids - 1st Class petroleum - soluble (Law Art.2 Para.7, Attached Table 1, Group 4) |
| Air Pollution Control Law | : | Hazardous Air Pollutants (Central Environment Council Report No. 9) Volatile Organic Compounds (Law Art.2 Para.4) (MOE Official Notice to Prefectures) |
| Law Relating to Prevention of Marine Pollution and Maritime Disasters | : | Noxious Liquid Substances - Category Y (Law Art.3(3), Enforcement Order, Art.1-2, Attached Table No.1 Item 2) |
| Foreign Exchange and Foreign Trade Control Act | : | Export Trade Control Ordinance appendix 1-16 |
| Ship Safety Act | : | Flammable liquids (Dangerous Goods Notification Schedule first second and third Article Dangerous Goods Regulations) |
| Civil Aeronautics Law | : | Flammable liquids (Hazardous materials notice Appended Table 1 Article 194 of the Enforcement Regulations) |
| Port Regulation Law | : | Flammable liquids (Article 21, Paragraph 2 of Law, Article 12 rule, notice attached table that defines the type of dangerous goods) |
| Road Act | : | Restriction for Vehicle Traffic (Enforcement Order Art.19-13, Publication of Japan Highway Public Corp.) |
| Waste Management on Public Cleansing Law | : | Specially Controlled Industrial Wastes (Act Art.2, para 5, Enforcement Order Art.2-4) |
| Waterworks Law | : | Hazardous Substances (Act Article 4 paragraph 2), Standard for Water Quality (Ministry Order No.101 of 2003) |
| Sewerage Law | : | Substances for Water Quality Standard (Act Art.12-2 Para.2, Enforcement Order Art.9-4) |
| Japanese Pollutant Release and Transfer Register Law (PRTR Law) | : | Class 1 Designated Chemical Substances (Act Art.2 para.2, Enforcement Order Art.1 Appended Table No.1) 1,4-Dioxane (100%) |
| Labor Standards Act | : | Chemical Substances Causing Occupational Illnesses (Act Art.75, Para.2, Ordinance Attached Table 1-2, Item 4-1, MHLW Notification No.36 of 1978) |

16. Other information

- Data sources : Handbook of 17524 Chemical Products, The Chemical Daily Co, Ltd.
International Chemical Safety Cards.
National Institute of Technology and Evaluation (NITE).
2020 Emergency Response Guidebook (ERG 2020).
- Other information : The SDS is copyrighted material of Hayashi Pure Chemical Ind, Ltd.
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