

SAFETY DATA SHEET

According to JIS Z 7253:2019
Revision date 27-Jul-2022
 Revision Number 2.06

Section 1: PRODUCT AND COMPANY IDENTIFICATION

Product Name	1,4-Dioxane
Product Code	042-28345

Manufacturer FUJIFILM Wako Pure Chemical Corporation
 1-2 Doshomachi 3-Chome
 Chuo-ku, Osaka 540-8605, Japan
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Supplier FUJIFILM Wako Pure Chemical Corporation
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Recommended uses and restrictions on use For research use only

Section 2: HAZARDS IDENTIFICATION

GHS classification

Classification of the substance or mixture

Flammable liquids	Category 2
Acute toxicity - Inhalation (Vapors)	Category 4
Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2A
Carcinogenicity	Category 1B
Specific target organ toxicity (single exposure)	Category 1, Category 3
Category 1 central nervous system	
Category 3 Respiratory irritation, Narcotic effects	
Specific target organ toxicity (repeated exposure)	Category 1, Category 2
Category 1 kidneys, liver, central nervous system	
Category 2 respiratory system	

Pictograms



Signal word

Danger

Hazard statements

- H225 - Highly flammable liquid and vapor
- H315 - Causes skin irritation
- H319 - Causes serious eye irritation
- H332 - Harmful if inhaled
- H350 - May cause cancer
- H335 - May cause respiratory irritation
- H336 - May cause drowsiness or dizziness
- H370 - Causes damage to the following organs: central nervous system

H372 - Causes damage to the following organs through prolonged or repeated exposure: kidneys, liver, central nervous system

H373 - May cause damage to the following organs through prolonged or repeated exposure: respiratory system

Precautionary statements-(Prevention)

- Obtain special instructions before use
- Do not handle until all safety precautions have been read and understood
- Use personal protective equipment as required
- Do not breathe dust/fume/gas/mist/vapors/spray
- Wash face, hands and any exposed skin thoroughly after handling
- Do not eat, drink or smoke when using this product
- Use only outdoors or in a well-ventilated area
- Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
- Keep container tightly closed
- Ground/bond container and receiving equipment
- Use explosion-proof electrical/ ventilating / lighting / equipment
- Use only non-sparking tools
- Take precautionary measures against static discharge
- Keep cool

Precautionary statements-(Response)

- IF exposed: Call a POISON CENTER or doctor/physician
- 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 skin irritation occurs: Get medical advice/attention
- IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
- Wash contaminated clothing before reuse
- IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
- Call a POISON CENTER or doctor/physician if you feel unwell
- In case of fire: Use CO₂, dry chemical, or foam for extinction

Precautionary statements-(Storage)

- Store in a well-ventilated place. Keep container tightly closed
- Store locked up

Precautionary statements-(Disposal)

- Dispose of contents/container to an approved waste disposal plant

Others

Other hazards Not available

Section 3: COMPOSITION/INFORMATION ON INGREDIENTS

Single Substance or Mixture Substance

Formula C₄H₈O₂

Chemical Name	Weight-%	Molecular weight	ENCS	ISHL No.	CAS RN
1,4-Dioxane	99.8	88.11	(5)-839	*	123-91-1

Note on ISHL No.: * in the table means announced chemical substances.

Impurities and/or Additives: Not applicable

Section 4: FIRST AID MEASURES

Inhalation

Remove to fresh air. If symptoms persist, call a physician.

Skin contact

Wash off immediately with soap and plenty of water. If symptoms persist, call a physician.

Eye contact

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediate medical attention is required.

Ingestion

Rinse mouth. Never give anything by mouth to an unconscious person. Call a physician or poison control center immediately. Do not induce vomiting without medical advice.

Protection of first-aiders

Use personal protective equipment as required.

Section 5: FIRE FIGHTING MEASURES

Suitable extinguishing media

Water spray (fog), Carbon dioxide (CO₂), Foam, Extinguishing powder, Sand

Unsuitable extinguishing media

No information available

Specific hazards arising from the chemical product

Thermal decomposition can lead to release of irritating and toxic gases and vapors. Vapors may form explosive mixtures with air

Special extinguishing method

No information available

Special protective actions for fire-fighters

Use personal protective equipment as required. Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear.

Section 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

For indoor, provide adequate ventilation process until the end of working. Deny unnecessary entry other than the people involved by, for example, using a rope. While working, wear appropriate protective equipments to avoid adhering it on skin, or inhaling the gas. Work from windward, and retract the people downwind.

Environmental precautions

To be careful not discharged to the environment without being properly handled waste water contaminated.

Methods and materials for contaminant and methods and materials for cleaning up

Absorb dry sand, earth, sawdust and the waste. Collect empty container that can be sealed.

Recovery, neutralization

No information available

Secondary disaster prevention measures

Clean contaminated objects and areas thoroughly observing environmental regulations.

Section 7: HANDLING AND STORAGE

Handling**Technical measures**

Highly flammable. Avoid contact with high temperature objects, spark, and strong oxidizing agents. Use with local exhaust ventilation.

Precautions

Do not rough handling containers, such as upsetting, falling, giving a shock, and dragging Prevent leakage, overflow, and scattering. Not to generate steam and dust in vain. Seal the container after use. After handling, wash hands and face, and then gargle In places other than those specified, should not be smoking or eating and drinking Should not be brought contaminated protective equipment and gloves to rest stops Deny unnecessary entry of non-emergency personnel to the handling area

Safety handling precautions

Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use personal protective equipment as required. Avoid contact with skin, eyes or clothing.

Storage**Safe storage conditions****Storage conditions**

Keep container protect from light, store in well-ventilated place at room temperature (preferably cool). Keep container tightly closed. Packed with an inert gas.

Safe packaging material

Glass

Incompatible substances

Strong oxidizing agents

Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls

In case of indoor workplace, seal the source or use a local exhaust system. Provide the safety shower facility, and hand- and eye-wash facility. And display their position clearly.

Exposure limits

Chemical Name	JSOH (Japan)	ISHL (Japan)	ACGIH
1,4-Dioxane 123-91-1	1ppm	ISHL/ACL: 10 ppm	TWA: 20 ppm Skin

Personal protective equipment

Respiratory protection	gas mask for organic gas
Hand protection	Impermeable protective gloves
Eye protection	protective eyeglasses or chemical safety goggles
Skin and body protection	Long-sleeved work clothes

General hygiene considerations

Handle in accordance with good industrial hygiene and safety practice.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Form

Color	colorless
Turbidity	clear
Appearance	liquid
Odor	characteristic odor
Melting point/freezing point	11 °C
Boiling point, initial boiling point and boiling range	101 °C
Flammability	Highly flammable liquid and vapor
Evaporation rate:	no data available
Flammability (solid, gas):	no data available
Upper/lower flammability or explosive limits	
Upper:	22 vol%
Lower:	2 vol%
Flash point	12 °C
Auto-ignition temperature:	180 °C
Decomposition temperature:	no data available
pH	no data available
Viscosity (coefficient of viscosity)	no data available
Dynamic viscosity	no data available
Solubilities	water and Ethanol : Very soluble.
n-Octanol/water partition coefficient:(log Pow)	-0.42
Vapour pressure	38.7
Specific Gravity / Relative density	1.031 - 1.036 g/mL
Vapour density	3.03
Particle characteristics	no data available

Section 10: STABILITY AND REACTIVITY

Stability

Reactivity	no data available
Chemical stability	Generates the peroxides with oxygen in the air. May be altered by light.
Hazardous reactions	None under normal processing
Conditions to avoid	Extremes of temperature and direct sunlight, Heat, flames and sparks, static electricity, spark
Incompatible materials	

Strong oxidizing agents

Hazardous decomposition productsCarbon monoxide (CO), Carbon dioxide (CO₂)**Section 11: TOXICOLOGICAL INFORMATION****Acute toxicity**

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
1,4-Dioxane	4200 mg/kg (rat)	2100 mg/kg (rat)	9158 ppm (rat) 4 h

Chemical Name	Acute toxicity -oral- source information	Acute toxicity -dermal- source information	Acute toxicity -inhalation gas- source information
1,4-Dioxane	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.

Chemical Name	Acute toxicity -inhalation vapor- source information	Acute toxicity -inhalation dust- source information	Acute toxicity -inhalation mist- source information
1,4-Dioxane	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.

Skin irritation/corrosion

Chemical Name	Skin corrosion/irritation source information
1,4-Dioxane	Based on the NITE GHS classification results.

Serious eye damage/ irritation

Chemical Name	Serious eye damage/irritation source information
1,4-Dioxane	Based on the NITE GHS classification results.

Respiratory or skin sensitization

Chemical Name	Respiratory or Skin sensitization source information
1,4-Dioxane	Based on the NITE GHS classification results.

Reproductive cell mutagenicity

Chemical Name	germ cell mutagenicity source information
1,4-Dioxane	Based on the NITE GHS classification results.

Carcinogenicity

Chemical Name	Carcinogenicity source information
1,4-Dioxane	Based on the NITE GHS classification results.

Chemical Name	NTP	IARC	ACGIH	JSOH (Japan)
1,4-Dioxane 123-91-1	Reasonably Anticipated	Group 2B	A3	Group 2B

Reproductive toxicity

Chemical Name	Reproductive toxicity source information
1,4-Dioxane	Based on the NITE GHS classification results.

STOT-single exposure

Chemical Name	STOT -single exposure- source information
1,4-Dioxane	Based on the NITE GHS classification results.

STOT-repeated exposure

Chemical Name	STOT -repeated exposure- source information
1,4-Dioxane	Based on the NITE GHS classification results.

Aspiration hazard

Chemical Name	Aspiration Hazard source information
1,4-Dioxane	Based on the NITE GHS classification results.

Section 12: ECOLOGICAL INFORMATION**Ecotoxicity**

Chemical Name	Algae/aquatic plants	Fish	Crustacea
1,4-Dioxane	<i>ErC50 : Pseudokirchneriella subcapitata</i>	<i>LC50 : Oryzias latipes var. > 100 mg/L 96 h</i>	<i>EC50 : Daphnia magna > 1000 mg/L 48 h</i>

	> 1000 mg/L 72 h		
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Other data

Chemical Name	Short-term (acute) hazardous to the aquatic environment source information	Long-term (chronic) hazardous to the aquatic environment source information
1,4-Dioxane	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.

Persistence and degradability	No information available
Bioaccumulative potential	No information available
Mobility in soil	No information available
Hazard to the ozone layer	No information available
Mobility	

Section 13: DISPOSAL CONSIDERATIONS

Waste from residues

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated container and contaminated packaging

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Section 14: TRANSPORT INFORMATION

ADR/RID

UN number	UN1165
Proper shipping name:	Dioxane
UN classification	3
Subsidiary hazard class	
Packing group	II
Marine pollutant	Not applicable

IMDG

UN number	UN1165
Proper shipping name:	Dioxane
UN classification	3
Subsidiary hazard class	
Packing group	II
Marine pollutant (Sea)	Not applicable
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	No information available

IATA

UN number	UN1165
Proper shipping name:	Dioxane
UN classification	3
Subsidiary hazard class	
Packing group	II
Environmentally Hazardous Substance	Not applicable

Section 15: REGULATORY INFORMATION

International Inventories

EINECS/ELINCS	Listed
TSCA	Listed

Japanese regulations

Fire Service Act	Category IV, Class I petroleums, dangerous grade 2 water-soluble
Poisonous and Deleterious	Not applicable

Substances Control Law

Industrial Safety and Health Act Harmful Substances Whose Names Are to be Indicated on the Label (Law Art.57, Para.1, Enforcement Order Art.18)
 Notifiable Substances (Law Art.57-2, Enforcement Order Art.18-2 Attached Table No.9)No.227
 Group 2 Specified Chemical Substance
 Substances with Health Hazards Prevention Guideline(Carcinogenicity Substance)
 Dangerous Substances - Flammable Substance (Enforcement Order Attached Table 1 Item 4)
 Working Environment Evaluation Standards, Administrative Control Levels (Law Art.65-2, Para.1)
 Priority Assessment Chemical Substances (Law Article 2, Para.5)

Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc**Regulations for the carriage and storage of dangerous goods in ship**

Flammable Liquids (Ordinance Art.3, Ministry of Transportation Ordinance Regarding Transport by Ship and Storage, Attached Table 1)

Civil Aeronautics Law

Flammable Liquids (Ordinance Art.194, MITL Notification for Air Transportation of Explosives etc., Attached Table 1)

Marine Pollution Prevention Law

Enforcement ordinance Appendix No. 1 Noxious liquid substance Category Y

Pollutant Release and Transfer Register Law (~2023.3.31)

Class 1

Class 1 - No.

150

Pollutant Release and Transfer Register Law (2023/4/1~)

Class 1

Class 1 - No.

150

Water Pollution Control Act

Harmful Substances (Law Art.2, Enforcement Order Art.2, Ordinance Designating Wastewater Standards Art.1)

Export Trade Control Order

Not applicable

Air Pollution Control Law

Hazardous Air Pollutants

Chemical Name	Poisonous and Deleterious Substances Control Law	Industrial Safety and Health Act Substances (Law Art.57-2) (~2024.3.31)	Pollutant Release and Transfer Register Law (~2023.3.31)
1,4-Dioxane 123-91-1 (99.8)	-	Applicable	Applicable

Section 16: OTHER INFORMATION**Key literature references and sources for data etc.**

NITE: National Institute of Technology and Evaluation (JAPAN)
<http://www.safe.nite.go.jp/japan/db.html>
 IATA dangerous Goods Regulations
 RTECS:Registry of Toxic Effects of Chemical Substances
 Japan Industrial Safety and Health Association GHS Model SDS
 Dictionary of Synthetic Organic Chemistry, SSOCJ, Koudansha Scientific Co.Ltd.
 Chemical Dictionary, Kyouritsu Publishing Co., Ltd.
 etc

Disclaimer

This SDS is according to JIS Z 7253: 2019. 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, 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.

GHS Classification is according to JIS Z7252(2019). *JIS: Japanese Industrial Standards

End of Safety Data Sheet