

1,4-Dioxane**34944-1L**

Version 1.1

Issuing date

Revision Date 05/26/2017

Print Date 08/07/2019

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING**Product information**

Trade name : 1,4-Dioxane

Number : 000000020219

Recommended use of the chemical and restrictions on use : Laboratory chemicals

Manufacturer or supplier's details : Honeywell Specialty Chemicals Seelze GmbH
Wunstorfer Straße 40
Seelze, 30926

For further information, please contact: : 1-800-368-0050
+1-231-726-3171
(Monday-Friday, 9:00am-5:00pm)

In case of emergency call : **Medical: 1-800-498-5701 or +1-303-389-1414**
: **Transportation (CHEMTREC): 1-800-424-9300 or +1-703-527-3887**
: **In Japan: +(81)-345209637**
: (24 hours/day, 7 days/week)

2. HAZARDS IDENTIFICATION**Classification of the substance or mixture**

Classification of the substance or mixture : Flammable liquids, Category 2
Eye irritation, Category 2A
Carcinogenicity, Category 2
Specific target organ toxicity - single exposure, Category 3

GHS Label elements, including precautionary statements

Symbol(s)



Signal word

: Danger

Hazard statements

: Highly flammable liquid and vapour.
Causes serious eye irritation.
May cause respiratory irritation.

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Suspected of causing cancer.

Precautionary statements

: **Prevention:**

Obtain special instructions before use.

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

Keep away from heat/sparks/open flames/hot surfaces. 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.

Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.

Wash skin thoroughly after handling.

Use only outdoors or in a well-ventilated area.

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

Response:

IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

IF IN EYES: Rinse cautiously with water for several minutes.

Remove contact lenses, if present and easy to do. Continue rinsing.

IF exposed or concerned: Get medical advice/ attention.

If eye irritation persists: Get medical advice/ attention.

In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.

Storage:

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

Keep cool.

Store locked up.

Disposal:

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

3. COMPOSITION/INFORMATION ON INGREDIENTSFormula : C₄H₈O₂

Chemical nature : Substance

Chemical name	CAS-No.	Concentration
1,4 Dioxane	123-91-1	<=100.00 %

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1,4 Dioxane

4. FIRST AID MEASURES

- General advice : First aider needs to protect himself.
Take off all contaminated clothing immediately.
Move out of dangerous area.
- Inhalation : Remove to fresh air.
If breathing is difficult, give oxygen.
Use oxygen as required, provided a qualified operator is present.
Call a physician.
- Skin contact : Wash off immediately with plenty of water for at least 15 minutes.
Take off contaminated clothing and shoes immediately.
Wash contaminated clothing before re-use.
Call a physician.
- Eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
Protect unharmed eye.
Call a physician.
- Ingestion : When swallowed, allow water to be drunk.
Do NOT induce vomiting.
Call a physician immediately.

5. FIREFIGHTING MEASURES

- Suitable extinguishing media : Dry powder
Carbon dioxide (CO₂)
Foam
Water spray
- Unsuitable extinguishing media : Do not use a solid water stream as it may scatter and spread fire.
- Specific hazards during firefighting : Flammable.
Vapours may form explosive mixtures with air.
Vapours are heavier than air and may spread along floors.
Vapors may travel to areas away from work site before igniting/flashing back to vapor source.
Fire may cause evolution of:
Carbon oxides
- Special protective equipment : Wear an approved positive pressure self-contained breathing

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for firefighters

apparatus in addition to standard fire fighting gear.

Further information

: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

6. ACCIDENTAL RELEASE MEASURESPersonal precautions,
protective equipment and
emergency procedures: Evacuate personnel to safe areas.
Wear personal protective equipment. Unprotected persons
must be kept away.
Ensure adequate ventilation.
Remove all sources of ignition.
Avoid inhalation of vapour or mist.
Avoid contact with skin, eyes and clothing.

Environmental precautions

: Collect contaminated fire extinguishing water separately. This
must not be discharged into drains.
Should not be released into the environment.Methods and materials for
containment and cleaning up: Ventilate the area.
Do not use sparking tools.
Use explosion-proof equipment.
Contain and collect spillage with non-combustible absorbent
materials, e.g. sand, earth, vermiculite, diatomaceous earth
and place in container for disposal according to local
regulations (see section 13).**7. HANDLING AND STORAGE****Handling**

Precautions for safe handling

: Wear personal protective equipment.
Use only in well-ventilated areas.
Avoid inhalation, ingestion and contact with skin and eyes.Advice on protection against
fire and explosion: Keep product and empty container away from heat and sources of
ignition.
No smoking.
Take precautionary measures against static discharges.
Vapours may form explosive mixtures with air.
May form explosive peroxides.**Storage**Conditions for safe storage,
including any
incompatibilities: Store in area designed for storage of flammable liquids.
Protect from physical damage.
Keep containers tightly closed in a dry, cool and well-
ventilated place.

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Store in original container.
Protect from exposure to air/oxygen (peroxide formation).

8. EXPOSURE CONTROLS/PERSONAL PROTECTION**Components with workplace control parameters**

Components	CAS-No.	Value	Control parameters	Update	Basis
1,4 Dioxane 1,4 Dioxane	123-91-1	TL : Threshold limits	(10 ppm)	08 2006	ISHL:Industrial Safety and Health Law OEL

		SKIN_DES : Skin designation:	Can be absorbed through the skin.	04 2007	Japan Society for Occupational Health:Japan Society for Occupational Health allowable concentration recommendation value
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		TWA : Time weighted average	3.6 mg/m3 (1 ppm)Provisional value.	09 2015	Japan Society for Occupational Health:Japan Society for Occupational Health allowable concentration recommendation value
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Appropriate engineering controls

Use with local exhaust ventilation.
Use explosion-proof equipment.

Individual protection measures, such as personal protective equipment

Respiratory protection : In case of insufficient ventilation, wear suitable respiratory equipment.

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Hand protection	: Impervious butyl rubber gloves Gloves must be inspected prior to use. Replace when worn.
Eye protection	: Safety goggles
Skin and body protection	: Protective suit
Hygiene measures	: Take off all contaminated clothing immediately. Remove and wash contaminated clothing before re-use. Recommended preventive skin protection Wash hands before breaks and at the end of workday. When using, do not eat, drink or smoke.
Protective measures	: Ensure that eyewash stations and safety showers are close to the workstation location. Legal requirements are to be considered in regard of the selection, use and care of personal protective equipment. Avoid exposure - obtain special instructions before use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	: liquid
Colour	: colourless
Odour	: aromatic
pH	: 6 - 8 at 500.00 g/l, 20 °C
Melting point/range	: 12 °C
Boiling point/boiling range	: 100 - 102 °C at 1,013 hPa
Flash point	: 52 °F (11 °C) Method: DIN 51755
Lower explosion limit	: 1.9 %(V)
Upper explosion limit	: 22.5 %(V)
Vapour pressure	: 36 hPa at 20 °C(68 °F)

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51 hPa
at 25 °C(77 °F)

Density : 1.031 - 1.034 g/cm³ at 20 °C

Water solubility : Note: completely miscible

Partition coefficient: n-octanol/water : log Pow: -0.42

Ignition temperature : 375 °C

Viscosity, dynamic : 1.27 mPa.s at 20 °C

Molecular weight : 88.11 g/mol

10. STABILITY AND REACTIVITY

Chemical stability : Stable under normal conditions.

Possibility of hazardous reactions : Reacts with air to form peroxides.
Hazardous polymerisation does not occur.

Conditions to avoid : Heat, flames and sparks.
Keep away from direct sunlight.
Protect from exposure to air/oxygen (peroxide formation).

Incompatible materials to avoid : Strong oxidizing agents
Strong acids
Air
Oxygen
Plastic materials can be attacked.

Oxidizing solids
Oxidizing liquids
Water reactive
Spontaneous combustion

Hazardous decomposition products : May form explosive peroxides.
In case of fire hazardous decomposition products may be produced such as:
Carbon monoxide

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Carbon dioxide (CO₂)**11. TOXICOLOGICAL INFORMATION**

- Acute oral toxicity : LD50: ca. 5,150 mg/kg
Species: Rat
Method: OECD Test Guideline 401
- Acute inhalation toxicity : LC0: ca. 155 mg/l
Exposure time: 1 h
Species: Rat
Method: OECD Test Guideline 403
- Acute dermal toxicity : Note: no data available
- Skin irritation : Species: Rabbit
Result: slight irritation
Note: According to the classification criteria of the European Union, the product is not considered as being a skin irritant.
- Eye irritation : Species: Rabbit
Result: Irritating to eyes.
Method: OECD Test Guideline 405
- Sensitisation : Species: Guinea pig
Classification: non-sensitizing
Method: Directive 67/548/EEC, Annex V, B.6.
- Genotoxicity in vitro : Test Method: In vitro gene mutation study in mammalian cells
Cell type: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Result: negative
Method: OECD Test Guideline 476
- : Test Method: Ames test
Metabolic activation: with and without metabolic activation
Result: negative
Method: OECD Test Guideline 471
- Genotoxicity in vivo : Test Method: Chromosome aberration test
Species: Mouse
Result: negative

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Further information
1,4 Dioxane

: Note:
Confirmed animal carcinogen with unknown relevance to humans.

12. ECOLOGICAL INFORMATION**Toxicity**

- Toxicity to fish : flow-through test
NOEC: 100 mg/l
Exposure time: 21 d
Species: *Oryzias latipes* (Orange-red killifish)
Method: OECD Test Guideline 204
- Toxicity to daphnia and other aquatic invertebrates : semi-static test
EC50: > 1,000 mg/l
Exposure time: 48 h
Species: *Daphnia magna* (Water flea)
Method: OECD Test Guideline 202
- Toxicity to algae : Growth rate
EC50: > 1,000 mg/l
Exposure time: 72 h
Species: *Selenastrum capricornutum* (green algae)
Method: OECD Test Guideline 201
- : Biomass
EC50: > 1,000 mg/l
Exposure time: 72 h
Species: *Selenastrum capricornutum* (green algae)
Method: OECD Test Guideline 201
- Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: 1,000 mg/l
Exposure time: 21 d
Species: *Daphnia magna* (Water flea)
Method: OECD Test Guideline 211

Persistence and degradability

- Biodegradability : Result: Not readily biodegradable.
Value: < 10 %
Method: OECD Test Guideline 301F

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Ecotoxicology Assessment

Results of PBT assessment

This substance is not considered to be persistent, bioaccumulating and toxic (PBT)., This substance is not considered to be very persistent and very bioaccumulating (vPvB).

13. DISPOSAL CONSIDERATIONS

WDPCL Waste Disposal and : Specially Controlled Industrial Waste
Public Cleansing Law

Disposal methods : In accordance with local and national regulations.

14. TRANSPORT INFORMATION**ADR**

UN/ID No. : UN 1165
Description of the goods : DIOXANE
Class : 3
Packing group : II
Classification Code : F1
Hazard Identification Number : 33
Labels : 3

IATA

UN/ID No. : UN 1165
Description of the goods : Dioxane
Class : 3
Packing group : II
Labels : 3
Packing instruction (cargo aircraft) : 364
Packing instruction : 353
(passenger aircraft)
Packing instruction : Y341
(passenger aircraft)

IMDG

UN/ID No. : UN 1165
Description of the goods : DIOXANE
Class : 3
Packing group : II

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Labels : 3
EmS Number 1 : F-E
EmS Number 2 : S-D

Marine pollutant : no

15. REGULATORY INFORMATION**National regulatory information**

Fire Service Law : Type 1 petroleums
JP FSL DS4 Flammable liquids
Storage Limit: 400 liters II

Fire Service Law : Flammable solid
JP FSL FS Designated Flammable Substances
Storage Limit: 3000 kg

Vessel Safety Law : Flammable liquids (Article 2 and 3 of rules on shipping and
JP VSL storage of dangerous goods and its Attached Table 1)

Aviation Law : Flammable liquids (Article 194 of The Enforcement Rules of
JP AVL Aviation Law and its Attached Table 1)

Chemical Substance : Listed
Control Law Type II Monitoring Chemical Substance.
DES (JP) Reference: (5)-839

Substances Subject to be :
Notified Names Threshold Concentration: 0.1 % wt 227
JP MSDSD

Substances Subject to be : Article 18
Indicated Names Threshold limits: 1 % wt 227
JPISHL LR

Other international regulations**Notification status**

US. Toxic Substances : On TSCA Inventory
Control Act

Australia. Industrial Chemical : On the inventory, or in compliance with the inventory
(Notification and

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Assessment) Act

Canada. Canadian Environmental Protection Act (CEPA). Domestic Substances List (DSL) : All components of this product are on the Canadian DSL

Japan. Kashin-Hou Law List : On the inventory, or in compliance with the inventory

Korea. Toxic Chemical Control Law (TCCL) List : On the inventory, or in compliance with the inventory

Philippines. The Toxic Substances and Hazardous and Nuclear Waste Control Act : On the inventory, or in compliance with the inventory

China. Inventory of Existing Chemical Substances : On the inventory, or in compliance with the inventory

New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA New Zealand : On the inventory, or in compliance with the inventory

16. OTHER INFORMATION

	HMIS III	NFPA
Health hazard	: 2*	2
Flammability	: 3	3
Physical Hazard	: 1	
Instability	:	1

* - Chronic health hazard

Hazard rating and rating systems (e.g. HMIS® III, NFPA): This information is intended solely for the use of individuals trained in the particular system.

Further information

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, use, processing, storage, transportation, disposal and release 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. Final determination of suitability of any

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material is the sole responsibility of the user. This information should not constitute a guarantee for any specific product properties.

Changes since the last version are highlighted in the margin. This version replaces all previous versions.

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