

1,4-Dioxane

34944-1L

Version 2.0

Revision Date 23.07.2021

Supersedes 1

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name : 1,4-Dioxane

SDS-number : 000000020219

Type of product : Substance

Remarks : SDS according to Art. 31 of Regulation (EC) 1907/2006.

Chemical name : 1,4-dioxane

Index-No. : 603-024-00-5

REACH Registration Number : no data available

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

Use of the Substance/Mixture : Laboratory chemicals

Uses advised against : none

1.3. Details of the supplier of the safety data sheet

Company	: Honeywell Specialty Chemicals Seelze GmbH Wunstorfer Straße 40 30926 Seelze Germany	Honeywell International, Inc. 115 Tabor Road Morris Plains, NJ 07950-2546 USA
Telephone	: (49) 5137-999 0	
For further information, please contact:	: PMTEU Product Stewardship: SafetyDataSheet@Honeywell.com	

1.4. Emergency telephone number

Emergency telephone number : +1-703-527-3887 (ChemTrec-Transport)
+1-303-389-1414 (Medical)

Country based Poison Control Center : see chapter 15.1

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SECTION 2: Hazards identification


2.1. Classification of the substance or mixture

REGULATION (EC) No 1272/2008

Flammable liquids Category 2
H225 Highly flammable liquid and vapour.
Eye irritation Category 2
H319 Causes serious eye irritation.
Specific target organ toxicity - single exposure Category 3 - Respiratory system
H335 May cause respiratory irritation.
Carcinogenicity Category 2
H351 Suspected of causing cancer.

2.2. Label elements

REGULATION (EC) No 1272/2008

Hazard pictograms	:													
Signal word	:	Danger												
Hazard statements	:	<table><tr><td>H225</td><td>Highly flammable liquid and vapour.</td></tr><tr><td>H319</td><td>Causes serious eye irritation.</td></tr><tr><td>H335</td><td>May cause respiratory irritation.</td></tr><tr><td>H351</td><td>Suspected of causing cancer.</td></tr><tr><td>EUH019</td><td>May form explosive peroxides.</td></tr><tr><td>EUH066</td><td>Repeated exposure may cause skin dryness or cracking.</td></tr></table>	H225	Highly flammable liquid and vapour.	H319	Causes serious eye irritation.	H335	May cause respiratory irritation.	H351	Suspected of causing cancer.	EUH019	May form explosive peroxides.	EUH066	Repeated exposure may cause skin dryness or cracking.
H225	Highly flammable liquid and vapour.													
H319	Causes serious eye irritation.													
H335	May cause respiratory irritation.													
H351	Suspected of causing cancer.													
EUH019	May form explosive peroxides.													
EUH066	Repeated exposure may cause skin dryness or cracking.													
Precautionary statements	:	<table><tr><td>P210</td><td>Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.</td></tr><tr><td>P260</td><td>Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.</td></tr><tr><td>P280</td><td>Wear protective gloves/protective clothing/eye protection/face protection.</td></tr><tr><td>P304 + P340</td><td>IF INHALED: Remove person to fresh air and keep comfortable for breathing.</td></tr><tr><td>P305 + P351 + P338</td><td>IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.</td></tr><tr><td>P308 + P313</td><td>IF exposed or concerned: Get medical advice/ attention.</td></tr></table>	P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.	P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.	P280	Wear protective gloves/protective clothing/eye protection/face protection.	P304 + P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.	P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.	P308 + P313	IF exposed or concerned: Get medical advice/ attention.
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2.3. Other hazards

Can be absorbed through skin. Repeated or prolonged exposure to the substance can produce liver damage. Repeated or prolonged exposure to the substance can produce kidney damage.

SECTION 3: Composition/information on ingredients

3.1. Substance

Chemical name	CAS-No. Index-No. REACH Registration Number EC-No.	Classification 1272/2008	Concentration	Remarks
1,4-dioxane	123-91-1 603-024-00-5 204-661-8	Flam. Liq. 2; H225 Carc. 2; H351 Eye Irrit. 2; H319 STOT SE 3; H335 EUH019, EUH066	< 100 %	

3.2. Mixture

Not applicable

Occupational Exposure Limit(s), if available, are listed in Section 8.
For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of 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.

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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.

4.2. Most important symptoms and effects, both acute and delayed

No data available

4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

See Section 11 for more detailed information on health effects and symptoms.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media:

Dry powder
Carbon dioxide (CO₂)
Foam
Water spray

Extinguishing media which shall not be used for safety reasons:

Do not use a solid water stream as it may scatter and spread fire.

5.2. Special hazards arising from the substance or mixture

Fire may cause evolution of:
Carbon oxides

5.3. Advice for firefighters

In the event of fire, wear self-contained breathing apparatus.
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

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Evacuate personnel to safe areas. Use personal protective equipment. Provide adequate ventilation. Remove all sources of ignition.

6.2. Environmental precautions

Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Should not be released into the environment.

6.3. Methods and materials for containment and cleaning up

Dilute with plenty of water.
Soak up with inert absorbent material.
Pick for disposal in tightly closed containers

6.4. Reference to other sections

For personal protection see section 8.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling:

Exhaust ventilation at the object is necessary. Do not breathe vapour.

Advice on protection against fire and explosion:

Normal measures for preventive fire protection. May form explosive peroxides. The product is easily combustible. Use only in explosion-proof areas. Take measures to prevent the build up of electrostatic charge. Keep away from sources of ignition - No smoking.

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.

7.2. Conditions for safe storage, including any incompatibilities

Further information on storage conditions:

Store in original container. Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from exposure to air/oxygen (peroxide formation).

7.3. Specific end use(s)

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no additional data available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits:

Components	Basis / Value type	Value / Form of exposure	Exceeding Factor	Remarks
1,4-dioxane	EH40 WEL SKIN_DES			Can be absorbed through the skin.
1,4-dioxane	EH40 WEL			Listed
1,4-dioxane	EU ELV TWA	73 mg/m3 20 ppm		Indicative
1,4-dioxane	EH40 WEL TWA	73 mg/m3 20 ppm		

SKIN_DES - Skin designation:
TWA - Time weighted average

DNEL/ PNEC-Values

Component	End-use/impact	Exposure duration	Value	Exposure routes	Remarks
1,4-dioxane	Workers / Long-term systemic effects		73 mg/m3	Inhalation	
1,4-dioxane	Workers / Acute local effects		144 mg/m3	Inhalation	
1,4-dioxane	Workers / Long-term systemic effects		21mg/kg bw/d	Skin contact	
1,4-dioxane	Consumers / Long-term systemic effects		18,25 mg/m3	Inhalation	
1,4-dioxane	Consumers / Acute local effects		72 mg/m3	Inhalation	

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1,4-dioxane	Consumers / Long-term systemic effects		12mg/kg bw/d	Skin contact	
1,4-dioxane	Consumers / Long-term systemic effects		0,24mg/kg bw/d	Ingestion	

Component	Environmental compartment / Value	Remarks
1,4-dioxane	Fresh water: 10 mg/l	Assessment factor: 10
1,4-dioxane	Marine water: 0,67 mg/l	Assessment factor: 1000
1,4-dioxane	Sewage treatment plant: 2700 mg/l	
1,4-dioxane	Fresh water sediment: 37 mg/kg dw	
1,4-dioxane	Soil: 0,153 mg/kg dw	Assessment factor: 1000

8.2. Exposure controls

Occupational exposure controls

The Personal Protective Equipment must be in accordance with EN standards:respirator EN 136, 140, 149; safety glasses EN 166; protective suit: EN 340, 463, 468, 943-1, 943-2; gloves EN 374, 511; safety shoes EN-ISO 20345.
Do not breathe vapours/dust.

Engineering measures

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

Personal protective equipment

Respiratory protection:

In the case of vapour formation use a respirator with an approved filter.

Hand protection:

Glove material: butyl-rubber
Break through time: > 480 min
Glove thickness: 0,7 mm
Butoject® 898

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Gloves must be inspected prior to use.

Replace when worn.

Remarks: Supplementary note: The specifications are based on information and tests from similar substances by analogy.

Due to varying conditions (e.g.temperature or other strains) it must be considered that the usage of a chemical protective glove in practice may be much shorter than the permeation time determined in accordance with EN 374.

Since actual conditions of practical use often deviate from standardised conditions according EN 374 the glove manufacturer recommends to use the chemical protective glove in practice not longer than 50% of the recommended permeation time.

Manufacturer's directions for use should be observed because of great diversity of types .

Suitable gloves tested according EN 374 are supplied e.g. from KCL GmbH, D-36124 Eichenzell, Vertrieb@kcl.de

Eye protection:

Safety goggles

Skin and body protection:

Protective suit

Environmental exposure controls

Handle in accordance with local environmental regulations and good industrial practices.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: liquid
Colour	: colourless
Odour	: aromatic
molecular weight	: 88,11 g/mol
Melting point/range	: 12 °C
Boiling point/boiling range	: 100 - 102 °C at 1.013 hPa
Upper explosion limit	: 22,5 %(V)
Lower explosion limit	: 1,9 %(V)
Flash point	: 11 °C

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Method: DIN 51755

Auto-ignition temperature	:	375 °C
pH	:	6 - 8 Concentration: 500 g/l at 20 °C
Viscosity, kinematic	:	No data available
Water solubility	:	completely miscible
Partition coefficient: n-octanol/water	:	log Pow -0,42
Vapour pressure	:	36 hPa at 20 °C
Vapour pressure	:	51 hPa at 25 °C
Density	:	1,031 - 1,034 g/cm ³ at 20 °C
Relative vapour density	:	No data available

9.2 Other Information

Evaporation rate	:	No data available
Viscosity, dynamic	:	1,27 mPa.s at 20 °C

SECTION 10: Stability and reactivity

10.1. Reactivity

Stable under normal conditions.

10.2. Chemical stability

No decomposition if used as directed.

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10.3. Possibility of hazardous reactions

Reacts with air to form peroxides.
Hazardous polymerisation does not occur.

10.4. Conditions to avoid

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

10.5. Incompatible materials

Strong oxidizing agents
Strong acids
Air
Oxygen
Plastic materials can be attacked.

10.6. Hazardous decomposition products

May form explosive peroxides.
In case of fire hazardous decomposition products may be produced such as:
Carbon monoxide
Carbon dioxide (CO₂)

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute oral toxicity:

LD₅₀
Species: Rat
Value: ca. 5.150 mg/kg
Method: OECD Test Guideline 401

Acute dermal toxicity:

No data available

Acute inhalation toxicity:

LC₀
Species: Rat
Value: ca. 155 mg/l
Exposure time: 1 h
Method: OECD Test Guideline 403

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Skin irritation:

Species: Rabbit

Result: slight irritation

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

Respiratory or skin sensitisation:

Species: Guinea pig

Classification: non-sensitizing

Method: Directive 67/548/EEC, Annex V, B.6.

Carcinogenicity:

Note: Classification based on Annex VI of regulation 1272/2008/EC.

Germ cell mutagenicity:

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

Test Method: Chromosome aberration test

Species: Mouse

Result: negative

Reproductive toxicity:

Remarks: Not classified due to data which are conclusive although insufficient for classification.

Aspiration hazard:

No data available

11.2. Information on other hazards

Endocrine disrupting properties

No data available

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Other information:

Solvent removes skin oil from the skin.

Solvent vapours have a narcotic effect if inhaled in high concentrations.

SECTION 12: Ecological information

12.1. Toxicity

Toxicity to fish:

NOEC

flow-through test

Species: *Oryzias latipes* (Orange-red killifish)

Value: 100 mg/l

Exposure time: 21 d

Method: OECD Test Guideline 204

Toxicity to aquatic plants:

EC50

Growth rate

Species: *Selenastrum capricornutum* (green algae)

Value: > 1.000 mg/l

Exposure time: 72 h

Method: OECD Test Guideline 201

EC50

Biomass

Species: *Selenastrum capricornutum* (green algae)

Value: > 1.000 mg/l

Exposure time: 72 h

Method: OECD Test Guideline 201

Toxicity to aquatic invertebrates:

EC50

semi-static test

Species: *Daphnia magna* (Water flea)

Value: > 1.000 mg/l

Exposure time: 48 h

Method: OECD Test Guideline 202

Chronic toxicity to aquatic invertebrates:

NOEC

Species: *Daphnia magna* (Water flea)

Value: 1.000 mg/l

Exposure time: 21 d

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Method: OECD Test Guideline 211

12.2. Persistence and degradability

Biodegradability:

Biodegradation: < 10 %

Exposure time: 29 d

Result: Not readily biodegradable.

Method: OECD Test Guideline 301F

12.3. Bioaccumulative potential

No data available

12.4. Mobility in soil

No data available

12.5. Results of PBT and vPvB 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).

12.6. Endocrine disrupting properties

No data available

12.7. Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product:

Dispose according to legal requirements.

Packaging:

Legal requirements are to be considered in regard of reuse or disposal of used packaging materials

Further information:

Provisions relating to waste:

EC Directive 2006/12/EC; 2008/98/EEC

Regulation No. 1013/2006

For personal protection see section 8.

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SECTION 14: Transport information

14.1 UN number

ADR/RID:1165

IMDG:1165

IATA:1165

14.2 UN proper shipping name

ADR/RID:DIOXANE

IMDG:DIOXANE

IATA:Dioxane

14.3 Transport hazard class(es)

ADR/RID: 3

IMDG: 3

IATA: 3

14.4 Packaging group

ADR/RID: II

IMDG: II

IATA: II

14.5 Environmental hazards

ADR/RID:no

Marine pollutant: no

14.6 Special precautions for user

No data available

14.7 Maritime transport in bulk according to IMO instruments

No data available

SECTION 15: Regulatory information

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

Basis	Value	Remarks
Directive 2012/18/EC Listed in Regulation : P5c: FLAMMABLE LIQUIDS	Quantity: 5.000.000 kg Quantity: 50.000.000 kg	
Substances of very high concern (SVHC)		This product does contain substances of very high concern according to Regulation (EC) No Article 57 above the respective regulatory 1907/2006 (REACH), concentration limit of ≥ 0.1 % (w/w).

Poison Control Center

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Country	Phone Number
Austria	+4314064343
Belgium	070 245245
Bulgaria	(+359)29154233
Croatia	(+3851)23-48-342
Cyprus	+357 2240 5611
Czech Republic	+420224919293; +420224915402
Denmark	82121212
Estonia	16662; (+372)6269390
Finland	9471977
France	+33(0)145425959
Greece	+30 210 779 3777
Hungary	(+36-80)201-199
Iceland	5432222
Ireland	+353(1)8092166
Italy	0382 24444
Germany	Berlin : 030/19240
	Bonn : 0228/19240
	Erfurt : 0361/730730
	Freiburg : 0761/19240
	Göttingen : 0551/19240
	Homburg : 06841/19240
	Mainz : 06131/19240
	Munich : 089/19240
Latvia	+37167042473

Country	Phone Number
Liechtenstein	+41 442515151
Lithuania	+370532362052
Luxembourg	070245245; (+352)80002-5500
Malta	+356 2395 2000
Netherlands	030-2748888
Norway	22591300
Poland	+48 42 25 38 400
Portugal	800250250
Romania	+40 21 318 3606
Slovakia (NTIC)	+421 2 54 774 166
Slovenia	+386 1 400 6051
Spain	+34915620420
Sweden	112 (begär Giftinformation);+46104566786
Switzerland	145
United Kingdom	(+44) 844 892 0111

Other inventory information

US. Toxic Substances Control Act
On TSCA Inventory

Australia. Industrial Chemical (Notification and Assessment) Act
On the inventory, or in compliance with the inventory

Canada. Canadian Environmental Protection Act (CEPA). Domestic Substances List (DSL)

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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. Existing Chemicals Inventory (KECI)

On the inventory, or in compliance with the inventory

Philippines. Inventory of Chemicals and Chemical Substances (PICCS)

On the inventory, or in compliance with the inventory

China. Inventory of Existing Chemical Substances (IECSC)

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

15.2 Chemical safety assessment

A Chemical Safety Assessment has not been carried out.

SECTION 16: Other information

Text of H-statements referred to under heading 3

1,4-dioxane	:	H225	Highly flammable liquid and vapour.
		H351	Suspected of causing cancer.
		H319	Causes serious eye irritation.
		H335	May cause respiratory irritation.
		EUH019	May form explosive peroxides.
		EUH066	Repeated exposure may cause skin dryness or cracking.
2,6-di-tert-Butyl-p-cresol (Stabilizer)	:	H400	Very toxic to aquatic life.
		H410	Very toxic to aquatic life with long lasting effects.

Further information

All directives and regulations refer to amended versions.

Vertical lines in the left hand margin indicate a relevant amendment from the previous version.

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Abbreviations:

EC European Community

CAS Chemical Abstracts Service

DNEL Derived no effect level

PNEC Predicted no effect level

vPvB Very persistent and very bioaccumulative substance

PBT Persistent, bioaccumulative and toxic substance

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 material is the sole responsibility of the user.

This information should not constitute a guarantee for any specific product properties.