

## 1,4-Dioxane

33147-1L

Version 3.0

Revision Date 14.04.2022

Supersedes 2

### 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 International Inc. Honeywell International, Inc.  
115 Tabor Road 115 Tabor Road  
07950-2546 Morris Plains Morris Plains, NJ 07950-2546  
USA USA  
  
Telephone :  
For further information, please contact: : 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

## 1,4-Dioxane

33147-1L

Version 3.0

Revision Date 14.04.2022

Supersedes 2

### 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 1B**

**H350 May cause cancer.**

#### 2.2. Label elements

##### REGULATION (EC) No 1272/2008

Hazard pictograms



Signal word

: **Danger**

Hazard statements

: H225 Highly flammable liquid and vapour.  
H319 Causes serious eye irritation.  
H335 May cause respiratory irritation.  
H350 May cause cancer.  
EUH019 May form explosive peroxides.  
EUH066 Repeated exposure may cause skin dryness or cracking.

Precautionary statements

: P201 Obtain special instructions before use.  
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.

## 1,4-Dioxane

33147-1L

Version 3.0

Revision Date 14.04.2022

Supersedes 2

**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.

### 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. 1B; H350 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.

## 1,4-Dioxane

33147-1L

Version 3.0

Revision Date 14.04.2022

Supersedes 2

*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.

#### 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.

## 1,4-Dioxane

33147-1L

Version 3.0

Revision Date 14.04.2022

Supersedes 2

---

### SECTION 5: Firefighting measures

#### 5.1. Extinguishing media

*Suitable extinguishing media:*

Dry powder  
Carbon dioxide (CO<sub>2</sub>)  
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

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

## 1,4-Dioxane

33147-1L

Version 3.0

Revision Date 14.04.2022

Supersedes 2

### 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)

no additional data available

## 1,4-Dioxane

33147-1L

Version 3.0

Revision Date 14.04.2022

Supersedes 2

### 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	

## 1,4-Dioxane

33147-1L

Version 3.0

Revision Date 14.04.2022

Supersedes 2

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:*



## 1,4-Dioxane

33147-1L

Version 3.0

Revision Date 14.04.2022

Supersedes 2

Glove material: butyl-rubber

Break through time: > 480 min

Glove thickness: 0,7 mm

Butoject® 898

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

## 1,4-Dioxane

33147-1L

Version 3.0

Revision Date 14.04.2022

Supersedes 2

	at 1.013 hPa
Upper explosion limit	: 22,5 %(V)
Lower explosion limit	: 1,9 %(V)
Flash point	: 11 °C Method: DIN 51755
Auto-ignition temperature	: 375 °C
Decomposition temperature	: No decomposition if used as directed.
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 <sup>3</sup> at 20 °C
Relative vapour density	: No data available

### 9.2 Other Information

Evaporation rate	: No data available
Viscosity, dynamic	: 1,27 mPa.s

## 1,4-Dioxane

33147-1L

Version 3.0

Revision Date 14.04.2022

Supersedes 2

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.

#### 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 (CO<sub>2</sub>)

---

### SECTION 11: Toxicological information

#### 11.1. Information on toxicological effects

*Acute oral toxicity:*

## 1,4-Dioxane

33147-1L

Version 3.0

Revision Date 14.04.2022

Supersedes 2

### 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

### *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:*

Species: not specified

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

## 1,4-Dioxane

33147-1L

Version 3.0

Revision Date 14.04.2022

Supersedes 2

Result: negative  
Method: OECD Test Guideline 471

Test Method: Chromosome aberration test  
Species: Mouse  
Result: negative

*Reproductive toxicity:*  
Species: not specified  
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

*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

## 1,4-Dioxane

33147-1L

Version 3.0

Revision Date 14.04.2022

Supersedes 2

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

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).

## 1,4-Dioxane

33147-1L

Version 3.0

Revision Date 14.04.2022

Supersedes 2

### 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.

---

## 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

**1,4-Dioxane**

33147-1L

Version 3.0

Revision Date 14.04.2022

Supersedes 2

**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	<b>Quantity:</b> 5.000.000 kg <b>Quantity:</b> 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 $\geq 0.1$ % (w/w).

**Poison Control Center**

Country	Phone Number
Austria	+4314064343
Belgium	070 245245
Bulgaria	(+)35929154233
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

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



## 1,4-Dioxane

33147-1L

Version 3.0

Revision Date 14.04.2022

Supersedes 2

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

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 Chemicals Act (AIIC), as amended  
On the inventory, or in compliance with the inventory

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. 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

## 1,4-Dioxane

33147-1L

Version 3.0

Revision Date 14.04.2022

Supersedes 2

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.
		H350	May cause 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.

#### 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 und 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

## 1,4-Dioxane

33147-1L

Version 3.0

Revision Date 14.04.2022

Supersedes 2

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.