

Safety Data Sheet

SECTION 1: Identification of the substance/mixture and of the company/undertaking**1.1 Product identifier**

Trade name/designation:	1,4-Dioxane Analytical reagent
Product No.:	D0192
Synonyms:	1,4-Diethylene dioxide, 1,4-Dioxacyclohexane, Glycoethylether, p-Dioxane
CAS No.	123-91-1

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

Relevant identified uses:	For Laboratory, Research or Manufacturing Use.
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1.3 Details of the supplier of the safety data sheet**Supplier****Avantor Performance Materials India Private Limited**

Street	501, 5th floor, Tiffany Building, Hiranandani Business Park,
Postal code/City	Thane, Maharashtra - 400607, India
Telephone	022-41288100

Emergency phone number

Telephone	18002022880
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Preparation Information

Product Information Compliance

1.4 E-mail

SDS@avantorsciences.com

SECTION 2: Hazard identification

2.1 Classification of the substance or mixture

Physical hazards

Flammable liquid, category 2

Health hazards

Eye irritation, category 2

Carcinogenicity, category 1B

Specific target organ toxicity (single exposure), category 3, Respiratory tract irritation

2.2 Label elements

Hazard pictograms



Signal word: Danger

Hazard statements

H225 - Highly flammable liquid and vapour.

H319 - Causes serious eye irritation.

H350 - May cause cancer.

H335 - May cause respiratory irritation.

Precautionary statements

Prevention:

P201 - Obtain special instructions before use.

P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P280 - Wear protective gloves/protective clothing/eye protection/face protection.

P261 - Avoid breathing dust/fume/gas/mist/vapours/spray.

Response:

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 none

SECTION 3: Composition / information on ingredients

Substances

Substance name	1,4-Dioxane
Molecular formula	C ₄ H ₈ O ₂
Molecular weight	88.11 g/mol
CAS No.	123-91-1

SECTION 4: First aid measures

4.1 Description of first aid measures

General information

Do not leave affected person unattended. If unconscious but breathing normally, place in recovery position and seek medical advice. Take off immediately all contaminated clothing. Highly flammable liquid and vapour. Wash contaminated clothing before reuse. When in doubt or if symptoms are observed, get medical advice.

After inhalation

Remove casualty to fresh air and keep warm and at rest. In case of respiratory tract irritation, consult a physician. When in doubt or if symptoms are observed, get medical advice.

In case of skin contact

Remove contaminated, saturated clothing immediately. Wash off any skin contamination immediately. Seek medical advice immediately.

After eye contact

Rinse immediately carefully and thoroughly with eye-bath or water. Remove contact lenses, if present and easy to do. Continue rinsing. Seek medical advice immediately. Consult an ophthalmologist.

In case of ingestion

Rinse mouth thoroughly with water. Never give anything by mouth to an unconscious person or a person with cramps. Do NOT induce vomiting. Immediately call a POISON CENTRE/doctor.

Self-protection of the first aider

First aider: Pay attention to self-protection! Wear personal protection equipment (refer to section 8). In case of insufficient ventilation and/or through use, explosive/highly flammable mixtures may develop.

4.2 Most important symptoms and effects, both acute and delayed

Irritation. Vomiting. Nausea. Headache. Gastrointestinal complaints.

4.3 Indication of any immediate medical attention and special treatment needed

No special information on medical attention and special treatment available.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

Water spray.
ABC-powder
Carbon dioxide (CO₂).
Nitrogen

Extinguishing media which must not be used for safety reasons

Full water jet

5.2 Special hazards arising from the substance or mixture

In case of fire may be liberated:
Carbon monoxide
Carbon dioxide (CO₂).

5.3 Advice for firefighters

In case of fire and/or explosion do not breathe fumes.
In case of insufficient ventilation and/or through use, explosive/highly flammable mixtures may develop.
Vapours are heavier than air, spread along floors and form explosive mixtures with air.
Special protective equipment for firefighters:

Wear a self-contained breathing apparatus and chemical protective clothing.
Use water spray jet to protect personnel and to cool endangered containers.
DO NOT fight fire when fire reaches explosives.

5.4 Additional information

Do not allow run-off from fire-fighting to enter drains or water courses.
Do not inhale explosion and combustion gases.
Use caution when applying carbon dioxide in confined spaces. Carbon dioxide can displace oxygen.
Use water spray jet to protect personnel and to cool endangered containers.
In case of fire: Evacuate area.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: Wear personal protection equipment (refer to section 8). Do not breathe gas/vapour. Remove victim out of the danger area. Stop leak if safe to do so. Eliminate all ignition sources if safe to do so.

6.2 Environmental precautions

Do not allow to enter into surface water or drains. Fire hazard.

6.3 Methods and material for containment and cleaning up

Take up mechanically, placing in appropriate containers for disposal. Absorb with liquid-binding material (sand, diatomaceous earth, acid- or universal binding agents). Ventilate affected area.

6.4 Additional information

Personal protection equipment: see section 8 Disposal information: see section 13

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advices on safe handling
Wear personal protection equipment (refer to section 8).
Avoid contact with eyes and skin.
Avoid inhalation of the product.
Use extractor hood (laboratory).
Provide adequate ventilation.
Measures to prevent fire, aerosol and dust generation
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Take precautionary measures against static discharges.
Measures required to protect the environment
Due to danger of explosion, prevent leakage of vapours into cellars, flues and ditches.

Wash hands before breaks and after work. Avoid contact with eyes and skin. When using do not eat, drink or smoke. Provide eye shower and label its location conspicuously.

7.2 Conditions for safe storage, including any incompatibilities

Recommended storage temperature: Keep bottles tightly closed and away from sources of ignition and heat.
Keep container tightly closed and in a well-ventilated place. Keep/Store away from combustible materials. Protect from direct sunlight. Unsuitable container/equipment material: Plastic packaging Due to danger of explosion, prevent leakage of vapours into cellars, flues and ditches.

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Does not contain substances above concentration limits fixing an occupational exposure limit.

8.2 Exposure controls

Appropriate engineering controls

Technical measures and the application of suitable work processes have priority over personal protection equipment. If handled uncovered, arrangements with local exhaust ventilation have to be used.

Personal protection equipment

Wear suitable protective clothing. When handling with chemical substances, protective clothing with CE-labels including the four control digits must be worn.

Eye/face protection

Eye glasses with side protection

Skin protection

Wear suitable gloves. When handling with chemical substances, protective gloves must be worn with the CE-label including the four control digits. In the case of wanting to use the gloves again, clean them before taking off and air them well. Check leak tightness/impermeability prior to use.

By short-term hand contact

Suitable material:	PVA (Polyvinyl alcohol)
Thickness of the glove material:	-
Breakthrough time:	60-120 min

By long-term hand contact

Suitable material:	Butyl caoutchouc (butyl rubber)
Thickness of the glove material:	0,50 mm
Breakthrough time:	> 480 min

Respiratory protection

no data available

Suitable respiratory protection apparatus:	no data available
Recommendation	no data available
Suitable material	no data available
Recommendation	no data available

Additional information

Wash hands before breaks and after work. Avoid contact with eyes and skin. When using do not eat, drink or smoke. Provide eye shower and label its location conspicuously.

Environmental exposure controls

no data available

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

(a) Appearance	
Physical state:	liquid
Colour:	colourless
(b) Odour:	no data available
(c) Odour threshold:	no data available

Safety relevant basic data

(d) pH:	6-8 (500 g/l; H ₂ O; 20 °C)
(e) Melting point/freezing point:	11.8 °C
(f) Initial boiling point and boiling range:	101.1 °C (1013 hPa)
(g) Flash point:	12 °C
(h) Evaporation rate:	no data available
(i) Flammability (solid, gas):	Highly flammable liquid and vapour.
(j) Flammability or explosive limits	
Lower explosion limit:	1.7 % (v/v)
Upper explosion limit:	25.2 % (v/v)
(k) Vapour pressure:	41 hPa (20 °C)
(l) Vapour density:	3.03 (20 °C)
(m) Density:	1.03 g/cm ³ (20 °C)
(n) Solubility(ies)	
Water solubility:	soluble (20 °C)
(o) Partition coefficient: n-octanol/water:	-0.27 (20 °C)
(p) Auto-ignition temperature:	300 °C (DIN 51794)
(q) Decomposition temperature:	not applicable
(r) Viscosity	
Kinematic viscosity:	no data available
Dynamic viscosity:	1.32 mPa*s (20 °C)
(s) Explosive properties:	not applicable
(t) Oxidising properties:	not applicable
(u) Particle characteristics	does not apply to liquids

9.2 Other information

Bulk density:	no data available
Refraction index:	1.4175 (589 nm; 20 °C)
Dissociation constant:	no data available
Surface tension:	no data available
Henry's Law Constant:	no data available

SECTION 10: Stability and reactivity

10.1 Reactivity

- Reactive substance.
- Vapours can form explosive mixtures with air.
- Risk of ignition.
- May form explosive peroxides.

10.2 Chemical stability

The product is chemically stable under standard ambient conditions (room temperature).

10.3 Possibility of hazardous reactions

Violent reaction with:

Nitric acid

Oxygen

Perchlorates

10.4 Conditions to avoid

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

10.5 Incompatible materials

Oxidising agent

Strong acid

10.6 Hazardous decomposition products

Decomposition products in case of fire: see section 5.

SECTION 11: Toxicological information
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11.1 Information on toxicological effects**Acute effects**

Acute oral toxicity:

LD50: > 5200 mg/kg - Rat - (OECD 401)

Acute dermal toxicity:

LD50: > 7600 mg/kg - Rabbit - (IUCLID)

Acute inhalation toxicity:

LC50: 46 mg/l - Rat - (Japan GHS Basis for Classification Data)

Irritant and corrosive effects:

Primary irritation to the skin:

not applicable

Irritation to eyes:

Causes serious eye irritation.

Irritation to respiratory tract:

May cause respiratory irritation.

Respiratory or skin sensitisation

In case of skin contact: not sensitising

After inhalation: not sensitising

STOT-single exposure

May cause respiratory irritation.

STOT-repeated exposure

not applicable

CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction)**Carcinogenicity**

May cause cancer.

Germ cell mutagenicity

No indications of human germ cell mutagenicity exist.

Reproductive toxicity

No indications of human reproductive toxicity exist.

Aspiration hazard

not applicable

Other adverse effects

no data available

Additional information

no data available

11.2 Endocrine disrupting properties

This substance does not have endocrine disrupting properties with respect to humans.

SECTION 12: Ecological information

12.1 Ecotoxicity**Fish toxicity:**

no data available

Daphnia toxicity:

no data available

Algae toxicity:

no data available

Bacteria toxicity:

no data available

12.2 Persistence and degradability

no data available

12.3 Bioaccumulative potential

Partition coefficient: n-octanol/water: -0.27 (20 °C)

12.4 Mobility in soil:

no data available

12.5 Results of PBT/vPvB assessment

not applicable

12.6 Endocrine disrupting properties

This substance does not have endocrine disrupting properties with respect to the environment.

12.7 Other adverse effects

no data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Appropriate disposal / Product

Dispose according to local legislation. Consult the appropriate local waste disposal expert about waste disposal. Send to a hazardous waste incinerator facility under observation of official regulations.

Appropriate disposal / Package

Dispose according to local legislation. Handle contaminated packages in the same way as the substance itself.

SECTION 14: Transport information

Land transport (ADR/RID)

14.1	UN-No.:	1165
14.2	Proper Shipping Name:	DIOXANE
14.3	Class(es):	3
	Classification code:	F1
	Hazard label(s):	3
14.4	Packing group:	II
14.5	Environmental hazards:	No
14.6	Special precautions for user:	
	Hazard identification number (Kemler No.):	33
	tunnel restriction code:	D/E
		(Passage forbidden through tunnels of category D when carried in bulk or in tanks. Passage forbidden through tunnels of category E.)

Sea transport (IMDG)

14.1	UN-No.:	1165
14.2	Proper Shipping Name:	DIOXANE
14.3	Class(es):	3
	Classification code:	
	Hazard label(s):	3
14.4	Packing group:	II
14.5	Environmental hazards:	No
	Marine pollutant:	No
14.6	Special precautions for user:	
	Segregation group:	-
	EmS-No.	F-E S-D
14.7	Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	not relevant

Air transport (ICAO-TI / IATA-DGR)

14.1	UN-No.:	1165
14.2	Proper Shipping Name:	DIOXANE
14.3	Class(es):	3
	Classification code:	
	Hazard label(s):	3
14.4	Packing group:	II
14.5	Special precautions for user:	

SECTION 15: Regulatory information

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

National regulations

no data available

SECTION 16: Other information

Abbreviations and acronyms

ACGIH - American Conference of Governmental Industrial Hygienists
 ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road
 AGS - Committee on Hazardous Substances (Ausschuss für Gefahrstoffe)
 CLP - Regulation on Classification, Labelling and Packaging of Substances and Mixtures
 DFG - German Research Foundation (Deutsche Forschungsgemeinschaft)
 DNEL - Derived No Effect Level
 Gestis - Information system on hazardous substances of the German Social Accident Insurance (Gefahrstoffinformationssystem der Deutschen Gesetzlichen Unfallversicherung)
 IATA-DGR - International Air Transport Association-Dangerous Goods Regulations
 ICAO-TI - International Civil Aviation Organization-Technical Instructions
 IMDG - International Maritime Code for Dangerous Goods
 KOSHA - Korea Occupational Safety and Health Agency
 LTV - Long Term Value
 NIOSH - National Institute for Occupational Safety and Health
 OSHA - Occupational Safety & Health Administration
 PBT - Persistent, Bioaccumulative and Toxic
 PNEC - Predicted No Effect Concentration
 RID - Regulation concerning the International Carriage of Dangerous Goods by Rail
 STV - Short Term Value
 SVHC - Substances of Very High Concern
 vPvB - very Persistent, very Bioaccumulative

Key literature references and sources for data

This Safety Data Sheet has been prepared based on information available for public as TOXNET information, European Chemicals Agency (ECHA) substance dossier, papers from international cancer research institutes (IARC Monographs), U.S. National Toxicology Program data, U.S. Agency for Toxic Substances and Disease Control (ATSDR), PubChem websites and SDS from our raw material manufacturers.

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Version

1.2

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2022-12-06

Additional information

Indication of changes:

Section 2

If you need an explanation of the change, contact the supplier (SDS@avantorsciences.com).

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