

SAFETY DATA SHEET

Preparation Date: 6/16/2014

Revision Date: 6/16/2014

Revision Number: G1

1. IDENTIFICATION

Product identifier

Product code: HS003
Product Name: P-DIOXANE, HISTOLOGICAL GRADE

Other means of identification

Synonyms: Dioxan
Dioxane
Dioxane-1,4
Glycol ethylene ether
Tetrahydro-p-dioxin
Tetrahydro-1,4-dioxin
1,4-Dioxane
Dioxane
1,4-Dioxacyclohexane
Diethylene dioxide
1,4-Diethylene dioxide
Diethylene dioxide
Diethylene ether
Di(ethylene oxide)
Diokan
Dioxanne (French)
p-Dioxin, tetrahydro-
Dioxyethylene ether
CAS #: 123-91-1
RTECS # JG8225000
CI#: Not available

Recommended use of the chemical and restrictions on use

Recommended use: Stabilizer. Solvent. Degreasing agent. Dispersing agent.
Uses advised against No information available

Supplier: Spectrum Chemicals and Laboratory Products, Inc.
14422 South San Pedro St.
Gardena, CA 90248
(310) 516-8000

Order Online At: <https://www.spectrumchemical.com>

Emergency telephone number Chemtrec 1-800-424-9300
Contact Person: Martin LaBenz (West Coast)
Contact Person: Regina Wachenheim (East Coast)

2. HAZARDS IDENTIFICATION

Classification

Product code: HS003

Product name: P-DIOXANE,
HISTOLOGICAL GRADE

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This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Serious eye damage/eye irritation	Category 2A
Carcinogenicity	Category 2
Specific target organ toxicity (single exposure)	Category 3
Specific target organ toxicity (repeated exposure)	Category 2
Flammable liquids	Category 2

Label elements

Danger

Hazard statements
Causes serious eye irritation
Suspected of causing cancer
May cause respiratory irritation. May cause drowsiness or dizziness
May cause damage to organs through prolonged or repeated exposure
Highly flammable liquid and vapor



Hazards not otherwise classified (HNOC)

Not Applicable

Other hazards

May be harmful in contact with skin

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
Wash face, hands and any exposed skin thoroughly after handling
Wear eye/face protection
Do not breathe dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area
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
Keep cool

Precautionary Statements - Response

IF exposed or concerned: Get medical advice/attention
In case of fire: Use CO₂, dry chemical, or foam to extinguish.
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.

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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.

Precautionary Statements - Storage

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

Precautionary Statements - Disposal

Dispose of contents/container to an approved waste disposal plant

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS-No.	Weight %	Trade Secret
p-Dioxane 123-91-1	123-91-1	100	*

4. FIRST AID MEASURES

First aid measures

General Advice:

Poison information centres in each State capital city can provide additional assistance for scheduled poisons (13 1126)

Skin Contact:

Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Get medical attention if irritation develops.

Eye Contact:

Flush eye with water for 15 minutes. Get medical attention.

Inhalation:

Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention.

Ingestion:

Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Consult a physician if necessary.

Most important symptoms and effects, both acute and delayed

Symptoms

Causes eye irritation. May cause skin irritation. Irritating to respiratory system. Dyspnea (Difficulty breathing and shortness of breath). Central nervous system effects. Dizziness. Drowsiness. Headache. Ataxia. Nausea. Vomiting.

Indication of any immediate medical attention and special treatment needed

Notes to Physician:

Treat symptomatically

Protection of first-aiders

First-Aid Providers: Avoid exposure to blood or body fluids. Wear gloves and other necessary protective clothing. Dispose of contaminated clothing and equipment as bio-hazardous waste

5. FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media:

Carbon dioxide (CO₂). Dry chemical. Alcohol-resistant foam. Water spray.

Unsuitable Extinguishing Media:

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

Specific hazards arising from the chemical

Hazardous Combustion Products:

Carbon monoxide; Carbon dioxide

Specific hazards:

Flammable. May be ignited by heat, sparks or flames. Vapor may travel considerable distance to source of ignition and flash back. Vapors may form explosive mixtures with air. Most vapors are heavier than air. They will spread along the ground and collect in low or confined areas (sewers, basements, tanks). Container explosion may occur under fire conditions or when heated. Fire may produce irritating, corrosive and/or toxic gases.

Special Protective Actions for Firefighters**Specific Methods:**

Water mist may be used to cool closed containers. For larger fires, use water spray or fog. Cool containers with flooding quantities of water until well after fire is out.

Special Protective Equipment for Firefighters:

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear

6. ACCIDENTAL RELEASE MEASURES**Personal precautions, protective equipment and emergency procedures****Personal Precautions:**

Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Avoid contact with skin, eyes and clothing. Use personal protective equipment. Remove all sources of ignition. Pay attention to flashback. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Use spark-proof tools and explosion-proof equipment. In case of large spill, water spray or vapor suppressing foam may be used to reduce vapors, but may not prevent ignition in closed spaces.

Environmental precautions

Prevent further leakage or spillage if safe to do so. Prevent entry into waterways, sewers, basements or confined areas.

Methods and material for containment and cleaning up**Methods for containment**

Stop leak if you can do it without risk. Absorb spill with inert material (e.g. vermiculite, dry sand or earth). In case of large spill, dike if needed. Dike far ahead of liquid spill for later disposal.

Methods for cleaning up

Use appropriate tools to put the spilled material in a suitable chemical waste disposal container. Use only non-sparking tools. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE**Precautions for safe handling****Technical Measures/Precautions:**

Provide sufficient air exchange and/or exhaust in work rooms. Remove all sources of ignition. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded. Keep away from incompatible materials.

Safe Handling Advice:

Wear personal protective equipment. Use only in well-ventilated areas. Avoid contact with skin, eyes and clothing. Keep away from heat and sources of ignition. Do not breathe vapors or spray mist. Do not ingest. When using do not smoke. Handle in accordance with good industrial hygiene and safety practice.

Conditions for safe storage, including any incompatibilities

Technical Measures/Storage Conditions:

Hygroscopic. Air sensitive. Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition. Keep away from direct sunlight. Store below 11.667 deg. C/53 deg. F. Store in a segregated and approved area. Store away from incompatible materials.

Incompatible Materials:

Oxidizing agents.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters**National occupational exposure limits****United States**

Components	OSHA	NIOSH	ACGIH	AIHA WHEEL
p-Dioxane - 123-91-1	100 ppm TWA 360 mg/m ³ TWA	1 ppm Ceiling 30 min 3.6 mg/m ³ Ceiling 30 min	20 ppm TWA	None

Canada

Components	Alberta	British Columbia	Ontario	Quebec
p-Dioxane - 123-91-1	20 ppm TWA 72 mg/m ³ TWA	20 ppm TWA	20 ppm TWA	20 ppm TWAEV 72 mg/m ³ TWAEV

Australia and Mexico

Components	Australia	Mexico
p-Dioxane 123-91-1	10 ppm TWA 36 mg/m ³ TWA	25 ppm TWA 90 mg/m ³ TWA 100 ppm STEL 360 mg/m ³ STEL

Appropriate engineering controls**Engineering measures to reduce exposure:**

Ensure adequate ventilation. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors and mist below their respective threshold limit value.

Individual protection measures, such as personal protective equipment**Personal Protective Equipment**

- Eye protection:** Goggles.
- Skin and body protection:** Chemical resistant apron. Long sleeved clothing. Gloves.
- Respiratory protection:** Vapor respirator. Be sure to use an approved/certified respirator or equivalent.
- Hygiene measures:** Avoid contact with skin, eyes and clothing. When using, do not eat, drink or smoke. Wash hands before breaks and immediately after handling the product.

9. PHYSICAL AND CHEMICAL PROPERTIES

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Physical state: Liquid.	Appearance: No information available	Color: Clear. Colorless.
Odor: Faint. Pleasant. Ether-like.	Taste No information available	Formula: C4-H8-O2
Molecular/Formula weight: 88.11	Flash point (°C): 12	Flashpoint (°C/°F): 12 °C/53.6 °F 15.8-18 °C/18.3-64.9 °F
Flash Point Tested according to: Closed cup Open cup	Lower Explosion Limit (%): 2%	Upper Explosion Limit (%): 22%
Autoignition Temperature (°C/°F): 180 °C/356 °F	pH: No information available	Melting point/range(°C/°F): 11.80 °C/53.2 °F
Boiling point/range(°C/°F): 101°C/214°F	Decomposition temperature(°C/°F): No information available	Specific gravity: 1.0329-1.0337
Density (g/cm3): No information available	Bulk density: No information available	Vapor pressure @ 20°C (kPa): 3.9
Evaporation rate: 2.7 (butyl acetate = 1)	Vapor density: 3.03	VOC content (g/L): No information available
Odor threshold (ppm): No information available	Partition coefficient (n-octanol/water): -0.27	Viscosity: No information available
Miscibility: Miscible with water	Solubility: No information available	

10. STABILITY AND REACTIVITY

Reactivity

Hydroperoxide-free Dioxane rapidly forms hydroperoxide on contact with air. Exposure to sunlight accelerates this formation. Decomposes to carbon monoxide.

Incompatible with silver perchlorate, oxidizing agents, sulfur trioxide, decaborane, triethynyl aluminum, boron trifluoride.

Dioxane may react with hydrogen in the presence of Rainey nickel above 210C (410F)

Reacts vigorously with oxidizing agents

Forms peroxides in absence of inhibitors an in the presence of air. Peroxide formation may occur in containers that have been opened and remain in storage. Peroxides can be detonated by friction

Chemical stability

Stability: Stable at normal conditions

Possibility of Hazardous Reactions: Hazardous polymerization does not occur

Conditions to avoid: Heat. Ignition sources. Exposure to sunlight.. Exposure to air. Exposure to moist air. Incompatible materials.

Incompatible Materials: Oxidizing agents.

Hazardous decomposition products: Carbon monoxide. Carbon dioxide.

Other Information

Corrosivity: No information available

Special Remarks on Corrosivity: No information available

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Principal Routes of Exposure:

Ingestion. Skin. Eyes. Inhalation.

Acute Toxicity

The following values are calculated based on chapter 3.1 of the GHS document .

ATEmix (inhalation-gas) 46mg/l

Component Information

p-Dioxane - 123-91-1

LD50/oral/rat = No information available

LD50/oral/mouse = 5300 mg/kg

LD50/dermal/rabbit = 7600 µL/kg Dermal LD50Rabbit

LD50/dermal/rat = No information available

LC50/inhalation/rat = 46 g/m³ Inhalation LC50 Rat 2 h
52 mg/l 4 h

LC50/inhalation/mouse = No information available

Other LD50 or LC50information = 2000 mg/kg Oral LD50 Rabbit

Product Information

LD50/oral/rat =

VALUE- Acute Tox Oral = 4200mg/kg

LD50/oral/mouse =

Value - Acute Tox Oral = 5300mg/kg

LD50/dermal/rabbit

VALUE-Acute Tox Dermal = 7600mg/kg

LD50/dermal/rat

VALUE -Acute Tox Dermal = No information available

LC50/inhalation/rat

VALUE-Vapor = 52mg/l (4-hr)

VALUE-Gas = No information available

VALUE-Dust/Mist = No information available

LC50/Inhalation/mouse

VALUE-Vapor = No information available

VALUE - Gas = No information available

VALUE - Dust/Mist = No information available

Symptoms

Skin Contact:

May cause skin irritation. Mild skin irritation. It may be absorbed through the skin.

Eye Contact:

Causes serious eye irritation. Moderate to severe eye irritation. Vapors cause eye irritation. Splashes cause severe irritation, possible corneal damage..

Inhalation Irritating to respiratory system. Easily absorbed through lungs. Causes irritation of the respiratory tract. May cause pulmonary edema. May affect respiration (coughing, dyspnea - shortness of breath and difficulty breathing), behavior and brain (headache, convulsions, dizziness, narcosis, confusion, ataxia, irritability, excitement, drowsiness, altered sleep time, psychophysical changes), cardiovascular system (increased blood pressure), gastrointestinal tract (nausea, vomiting), liver, and kidneys.

Ingestion Causes gastrointestinal (digestive) tract irritation with nausea, vomiting, sore throat, abdominal pain. May also affect behavior (general anesthetic, urinary system).

Aspiration hazard No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Chronic Toxicity Prolonged exposure may cause central nervous system depression, loss of appetite, nausea, abdominal tenderness, and liver or kidney damage.

Prolonged skin contact may cause cracking and drying of skin.

Sensitization: No information available

Mutagenic Effects: May affect genetic material
Animal experiments showed mutagenic effects

Carcinogenic effects: Possibly carcinogenic to humans. Confirmed Animal Carcinogen with Unknown Relevance to Humans.

Components	ACGIH - Carcinogens	IARC	NTP	OSHA HCS - Carcinogens	Australia - Prohibited Carcinogenic Substances	Australia - Notifiable Carcinogenic Substances
p-Dioxane	A3 Confirmed Animal Carcinogen with Unknown Relevance to Humans	Group 2B - Monograph 71 [1999] Supplement 7 [1987] Monograph 11 [1976]	Reasonably Anticipated To Be A Human Carcinogen	Present	Not listed	Not listed

ACGIH (American Conference of Governmental Industrial Hygienists)

IARC (International Agency for Research on Cancer)

Group 2B - Possibly Carcinogenic to Humans

NTP (National Toxicology Program)

OSHA (Occupational Safety and Health Administration of the US Department of Labor)

Reproductive toxicity No data is available

Reproductive Effects: No information available

Developmental Effects: No information available

Teratogenic Effects: No information available

Specific Target Organ Toxicity

STOT - single exposure respiratory system. central nervous system.

STOT - repeated exposure liver. kidney. Skin.

Target Organs: Skin. Liver. Kidneys.

12. ECOLOGICAL INFORMATION

Ecotoxicity

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Ecotoxicity effects: Aquatic environment.

p-Dioxane - 123-91-1

Freshwater Fish Species Data: 10306 - 14742 mg/L LC50 Pimephales promelas 96 h static 1
9850 mg/L LC50 Pimephales promelas 96 h 1
9850 mg/L LC50 Pimephales promelas 96 h flow-through 1
10000 mg/L LC50 Lepomis macrochirus 96 h semi-static 1
10000 mg/L LC50 Lepomis macrochirus 96 h static 1

Water Flea Data: 163 mg/L EC50 water flea 48 h

Persistence and degradability: Not inherently biodegradable

Bioaccumulative potential: Potential for bioconcentration in aquatic organisms is low.

Mobility: It is expected to have high mobility in soil.

13. DISPOSAL CONSIDERATIONS

Disposal Methods

Waste from residues / unused products:

Waste must be disposed of in accordance with Federal, State and Local regulation.

Contaminated packaging:

Empty containers should be taken for local recycling, recovery or waste disposal

Components	RCRA - F Series Wastes	RCRA - K Series Wastes	RCRA - P Series Wastes	RCRA - U Series Wastes
<i>p</i> -Dioxane	None	None	None	U108

14. TRANSPORT INFORMATION

DOT

UN-No: UN1165
Proper Shipping Name: Dioxane
Hazard Class: 3
Subsidiary Risk: Not applicable
Packing Group: II
Marine Pollutant: No data available
ERG No: 127
DOT RQ (lbs): No information available

Symbol(s): R3

TDG (Canada)

UN-No: UN1165
Proper Shipping Name: Dioxane
Hazard Class: 3
Subsidiary Risk: No information available
Packing Group: II
Description: No information available

ADR

Product code: HS003

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14. TRANSPORT INFORMATION

UN-No: UN1165
Proper Shipping Name: Dioxane
Hazard Class: 3
Packing Group: II
Subsidiary Risk: No information available
Classification Code: No information available
Description: No information available
CEFIC Tremcard No: No information available

IMO / IMDG

UN-No: UN1165
Proper Shipping Name: Dioxane
Hazard Class: 3
Subsidiary Risk: No information available
Packing Group: II
Description: No information available
IMDG Page: No information available
Marine Pollutant: No information available
EMS: F-E
MFAG: No information available
Maximum Quantity: No information available

RID

UN-No: UN1165
Proper Shipping Name: Dioxane
Hazard Class: 3
Subsidiary Risk: 3
Packing Group: II
Classification Code: No information available
Description: No information available

ICAO

UN-No: UN1165
Proper Shipping Name: Dioxane
Hazard Class: 3
Subsidiary Risk: No information available
Packing Group: II
Description: No information available

IATA

UN-No: UN1165
Proper Shipping Name: Dioxane
Hazard Class: 3
Subsidiary Risk: No information available
Packing Group: II
ERG Code: 3L
Description: No information available

15. REGULATORY INFORMATION

International Inventories

Components	U.S. TSCA	KOREA KECL	Philippines (PICCS)	Japan ENCS	CHINA	Australia (AICS)	EINECS-No.
<i>p-Dioxane</i>	Present	Present KE-10463	Present	Present (5)-839	Present	Present	Present 204-661-8

U.S. Regulations

p-Dioxane

Massachusetts RTK: Present
New Jersey RTK Hazardous Substance List: Present
New Jersey (EHS) List: Present
New Jersey - Discharge Prevention - List of Hazardous Substances: Present
Pennsylvania RTK: Environmental hazard
 Special hazardous substance
Pennsylvania RTK - Environmental Hazard List Present
Pennsylvania RTK - Special Hazardous Substances Present
Minnesota - Hazardous Substance List: Present
New York Release Reporting - List of Hazardous Substances:
 100 lb RQ
 1 lb RQ
Louisiana Reportable Quantity List for Pollutants: 100lbfinal RQ
 45.4kgfinal RQ
California Directors List of Hazardous Substances: Present

California Prop. 65: Safe Drinking Water and Toxic Enforcement Act of 1986.

Chemicals Known to the State of California to Cause Cancer:

WARNING: This product contains a chemical known to the State of California to cause cancer. (See table below)

Chemicals Known to the State of California to Cause Reproductive Toxicity:

This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

Components	Carcinogen	Developmental Toxicity	Male Reproductive Toxicity	Female Reproductive Toxicity:
<i>p</i> -Dioxane	carcinogen	Not Listed	Not Listed	Not Listed

CERCLA/SARA

Components	CERCLA - Hazardous Substances and their Reportable Quantities	Section 302 Extremely Hazardous Substances and TPQs	Section 302 Extremely Hazardous Substances and RQs	Section 313 - Chemical Category	Section 313 - Reporting <i>de minimis</i>
<i>p</i> -Dioxane	100 lb final RQ 45.4 kg final RQ	None	None	None	0.1 % de minimis concentration

U.S. TSCA

Components	TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)	TSCA 8(d) -Health and Safety Reporting
<i>p</i> -Dioxane	Not Applicable	Not Applicable

Canada

WHMIS hazard class:

B2 Flammable liquid
 D2A Very toxic materials
 D2B Toxic materials

p-Dioxane

B2 D2A D2B

Canada Controlled Products Regulation:

This product has been classified according to the hazard criteria of the CPR (Controlled Products Regulation) and the MSDS contains all of the information required by the CPR.

Components	WHMIS Ingredient Disclosure List -
<i>p</i> -Dioxane	0.1 %

Inventory

Components	Canada (DSL)	Canada (NDSL)
p-Dioxane	Present	Not Listed

Components	CEPA Schedule I - Toxic Substances	CEPA - 2010 Greenhouse Gases Subject to Mandatory Reporting
p-Dioxane	Not listed	Not listed

EU Classification

R-phrase(s)

R11 - Highly flammable.
 R19 - May form explosive peroxides.
 R40 - Limited evidence of a carcinogenic effect
 R66 - Repeated exposure may cause skin dryness or cracking.
 R36/37 - Irritating to eyes and respiratory system.

S -phrase(s)

S 2 - Keep out of the reach of children.
 S 9 - Keep container in a well-ventilated place.
 S16 - Keep away from sources of ignition - No smoking.
 S46 - If swallowed, seek medical advice immediately and show this container or label.
 S36/37 - Wear suitable protective clothing and gloves.

Components	Classification	Concentration Limits:	Safety Phrases
p-Dioxane	F; R11-19 Xi; R36/37 Carc.Cat.3; R40 R66	No information	S2 S9 S16 S36/37 S46

The product is classified in accordance with Annex VI to Directive 67/548/EEC

Indication of danger:

Xi - Irritant.
 Xn - Harmful.
 F - Highly flammable.



16. OTHER INFORMATION

16. OTHER INFORMATION

NFPA	HMIS	Personal Protective Equipment
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Health Hazard	2
Fire Hazard	3
Reactivity	0



See Section 8.

Preparation Date: 6/16/2014
Revision Date: 6/16/2014
Prepared by: Sonia Owen

Disclaimer:

All chemicals may pose unknown hazards and should be used with caution. This Safety Data Sheet (SDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. The physical properties reported in this SDS are obtained from the literature and do not constitute product specifications. Information contained herein does not constitute a warranty, whether expressed or implied, as to the safety, merchantability or fitness of the goods for a particular purpose. Spectrum Chemicals & Laboratory Products, Inc. assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits, arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Spectrum assumes no responsibility for the completeness or accuracy of the information contained herein.

End of Material Safety Data Sheet