

MSDS# 26970

Section 1 - Chemical Product and Company Identification

MSDS Name: 1,4-Dioxane

Catalog Numbers: AC117110000, AC117110010, AC117110025, AC117110050, AC117110250, AC167800000, AC167800000, AC167800010, AC167800025, AC167805000, AC268340000, AC268340010, AC268340010, AC268340025, AC270490000, AC270490010, AC270490025, AC270492500, AC270492500, AC326890000, AC326890010, AC326891000, AC326892500, AC364340000, AC364340000, AC364340010, AC364341000, AC408820000, AC408820010, AC61033019, AC61033019, AC61033019, AC61033050, AC61033050, AC61033115, AC61033115, AC61033200, AC61033200, AC61033200, 40882-5000, 61033-1000, 61512-0010, 61512-1000, BP2611-100, D111-4, D111-4LC, D111-500, D116-200, D116-4, D117-1, D117RS-19, D117RS-200, D117RS-50, D56S-4, NC9734646

Synonyms: Diox; Diethylene dioxide; OptiDry.

Company Identification: Fisher Scientific  
One Reagent Lane  
Fair Lawn, NJ 07410  
For information in the US, call: 201-796-7100  
Emergency Number US: 201-796-7100  
CHEMTREC Phone Number, US: 800-424-9300

Section 2 - Composition, Information on Ingredients

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CAS#: 123-91-1  
Chemical Name: 1,4-Dioxane  
%: 97+  
EINECS#: 204-661-8  
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Hazard Symbols:

XN F



Risk Phrases:

11 19 36/37 40 66

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Danger! May form explosive peroxides. Flammable liquid and vapor. Causes eye, skin, and respiratory tract irritation. Repeated exposure may cause skin dryness or cracking. Possible cancer hazard. May cause cancer based on animal data.

Target Organs: Kidneys, central nervous system, liver, respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: May cause skin irritation. Causes skin irritation. May be harmful if absorbed through the skin. Repeated or prolonged exposure may cause drying and cracking of the skin.

Ingestion: May cause irritation of the digestive tract. May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure. May be harmful if swallowed.

Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache,

Inhalation: dizziness, unconsciousness and coma. Causes respiratory tract irritation. May cause liver and kidney damage. May be harmful if inhaled.

Chronic: Possible cancer hazard based on tests with laboratory animals. May cause liver and kidney damage. Adverse reproductive effects have been reported in animals. Laboratory experiments have resulted in mutagenic effects. Chronic exposure may cause blood effects. Exposure to high concentrations may cause central nervous system depression. Animal studies have reported the development of tumors.

#### Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician:

#### Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors may form an explosive mixture with air. Vapors can travel to a source of ignition and flash back. Will burn if involved in a fire. Flammable liquid and vapor. May form explosive peroxides.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or alcohol-resistant foam.

Autoignition Temperature: 180 deg C ( 356.00 deg F)

Flash Point: 12 deg C ( 53.60 deg F)

Explosion Limits: Lower: 2 vol %

Explosion Limits: Upper: 22 vol %

NFPA Rating: health: 2; flammability: 3; instability: 3;

#### Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Wear a self contained breathing apparatus and appropriate personal protection. (See Exposure Controls, Personal Protection section). Remove all sources of ignition. Use a spark-proof tool. Do not let this chemical enter the environment.

#### Section 7 - Handling and Storage

Handling: Use spark-proof tools and explosion proof equipment. Do not get in eyes, on skin, or on clothing. Take precautionary measures against static discharges. Keep away from heat, sparks and flame. Do not ingest or inhale. Use only in a chemical fume hood. If peroxide formation is suspected, do not open or move container. Do not distill to dryness. Test for peroxide formation before distillation.

Storage: Keep away from sources of ignition. Store in a tightly closed container. Store in a dry area. Flammables-area. Regularly check inhibitor levels to maintain peroxide levels below 1%. After opening, purge container with nitrogen before reclosing. Periodically test for peroxide formation on long-term storage. Addition of water or appropriate reducing materials will lessen peroxide formation. Store under nitrogen. Containers should be dated when opened and tested periodically for the presence of peroxides. Should crystals form in a peroxidizable liquid, peroxidation may have occurred and the product should be considered extremely dangerous. In this instance, the container should only be opened remotely by professionals. May form explosive peroxides on prolonged storage.

#### Section 8 - Exposure Controls, Personal Protection

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs

1,4-Dioxane	20 ppm; Skin - potential significant contribution to overall exposure by the cutaneous route	500 ppm IDLH	100 ppm TWA; 360 mg/m3 TWA
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OSHA Vacated PELs: 1,4-Dioxane: 25 ppm TWA; 90 mg/m3 TWA

Engineering Controls:

Use explosion-proof ventilation equipment. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use only under a chemical fume hood.

Exposure Limits

Personal Protective Equipment

- Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
- Skin: Wear appropriate protective gloves to prevent skin exposure.
- Clothing: Wear appropriate protective clothing to prevent skin exposure.
- Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Liquid

Color: clear, colorless - APHA: 15 max

Odor: ethereal odor

pH: 6 - 8 (500 g/L aq.sol.)

Vapor Pressure: 41 mbar @ 20 deg C

Vapor Density: Not available

Evaporation Rate: Not available

Viscosity: 1.54 cPa @ 20 deg C

Boiling Point: 101 deg C @ 760 mmHg ( 213.80°F)

Freezing/Melting Point: 12 deg C ( 53.60°F)

Decomposition Temperature: Not available

Solubility in water: Soluble

Specific Gravity/Density: 1.030

Molecular Formula: C4H8O2

Molecular Weight: 88.11

Section 10 - Stability and Reactivity

- Chemical Stability: May form explosive peroxides. Moisture sensitive.
- Conditions to Avoid: Incompatible materials, light, ignition sources, excess heat, exposure to moist air or water, electrical sparks.
- Incompatibilities with Other Materials: Strong oxidizing agents, reducing agents, halogens, silver perchlorate, oxygen.
- Hazardous Decomposition Products: Carbon monoxide, carbon monoxide, carbon dioxide.
- Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

- RTECS#: CAS# 123-91-1: JG8225000
- RTECS: CAS# 123-91-1: Draize test, rabbit, eye: 100 mg Severe; Draize test, rabbit, eye: 100 mg/24H Moderate; Inhalation, mouse: LC50 = 37 gm/m3/2H; Inhalation, rat: LC50 = 46 gm/m3/2H;

LD50/LC50:  
Oral, mouse: LD50 = 5300 mg/kg;  
Oral, rabbit: LD50 = 2 gm/kg;  
Oral, rat: LD50 = 4200 mg/kg;  
Skin, rabbit: LD50 = 7600 uL/kg;

Carcinogenicity: 1,4-Dioxane - ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans  
California: carcinogen, initial date 1/1/88 NTP: Suspect carcinogen IARC: Group 2B carcinogen

Other: See actual entry in RTECS for complete information.

#### Section 12 - Ecological Information

Ecotoxicity: Fish: Bluegill/Sunfish: LC50 = >10,000mg/L; 96 Hr.; Static conditions, 23 degrees C  
Water flea Daphnia: EC50 =163 mg/L; 48 Hr.; Static Condition, 20-21 degrees C

#### Section 13 - Disposal Considerations

Dispose of in a manner consistent with federal, state, and local regulations.

#### Section 14 - Transport Information

#### US DOT

Shipping Name: DIOXANE

Hazard Class: 3

UN Number: UN1165

Packing Group: II

Canada TDG

Shipping Name: DIOXANE

Hazard Class: 3

UN Number: UN1165

Packing Group: II

USA RQ: CAS# 123-91-1: 100 lb final RQ; 45.4 kg final RQ

#### Section 15 - Regulatory Information

#### European/International Regulations

##### European Labeling in Accordance with EC Directives

Hazard Symbols: XN F

Risk Phrases:

R 11 Highly flammable.

R 19 May form explosive peroxides.

R 36/37 Irritating to eyes and respiratory system.

R 40 Limited evidence of a carcinogenic effect.

R 66 Repeated exposure may cause skin dryness or cracking.

Safety Phrases:

S 9 Keep container in a well-ventilated place.

S 16 Keep away from sources of ignition - No smoking.

S 36/37 Wear suitable protective clothing and gloves.

S 46 If swallowed, seek medical advice immediately and show this container or label.

#### WGK (Water Danger/Protection)

CAS# 123-91-1: 2

#### Canada

CAS# 123-91-1 is listed on Canada's DSL List

Canadian WHMIS Classifications: B2, D2A, D2B, F

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

CAS# 123-91-1 is listed on Canada's Ingredient Disclosure List

US Federal

TSCA

CAS# 123-91-1 is listed on the TSCA  
Inventory.

Section 16 - Other Information

MSDS Creation Date: 6/16/1999

Revision #10 Date 7/20/2009

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential, or exemplary damages howsoever arising, even if the company has been advised of the possibility of such damages.

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