

MATERIAL SAFETY DATA SHEET

PRODUCT NAME: 1,4-DIOXANE

CAS Number: 123-91-1

1. IDENTIFICATION:

Product Code : 90020, 90396, 90156, 90723, 91649, 93287, 94030, 94252, 98152

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2. HAZARDS IDENTIFICATION:**Hazard classification****Physical hazards**

Flammable liquids : Category 2


Health hazards

Eye irritation : Category 2

Carcinogenicity : Category 1B

**Specific target organ
toxicity – Single exposure,
Oral** : Category 3

Labels elements :

Hazard symbol : 

Signal word : Danger

Hazard statement : Highly flammable liquid and vapor.
Causes serious eye irritation.
May cause respiratory irritation.
May cause cancer.

Precautionary statement

Prevention : Obtain special instructions before use.
Do not breathe dust/ fume/ gas/ mist/ vapors/ spray. Do not handle until all safety precautions have been read and understood.
Wear protective gloves/ protective clothing/ eye protection/ face protection.
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.

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Response	: IF exposed or concerned: Get medical advice/ attention. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF INHALED: Remove person to fresh air and keep comfortable for breathing. IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
Storage	: Store in a dry & well-ventilated place. Keep container tightly closed. Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Disposal	: Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.
Other hazards which do not result in GHS classification	: This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

3. COMPOSITION/ INFORMATION ON INGREDIENTS:

Ingredient	CAS Number	Percent	Hazardous
1,4-Dioxane	123-91-1	NLT 99.0%	Yes

4. FIRST AID MEASURES:

General information	: Get medical advice/attention if you feel unwell. Show this safety data sheet to the doctor in attendance.
Ingestion	: Call a physician or poison control center immediately. Rinse mouth. Do NOT induce vomiting. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.
Inhalation	: Move to fresh air. Call a physician or poison control center immediately. If breathing stops, provide artificial respiration. If breathing is difficult, give oxygen. Get medical attention if symptoms persist.
Skin contact	: Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove contact lenses. Get medical attention.
Eye contact	: Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove contact lenses. Get medical attention.
Most important symptoms/effects, acute and delayed	: The most important known symptoms and effects are described in the labelling (see section 2.0)
Indication of immediate medical attention and special treatment needed	: No data available.

5. FIRE FIGHTING MEASURES:

General information	: Flammable liquid and vapor.
Suitable (and unsuitable) extinguishing media	
Suitable extinguishing	: Water spray, foam, dry powder or carbon dioxide.

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media

Unsuitable extinguishing media : Avoid water in straight hose stream; will scatter and spread fire.

Specific hazards arising from the chemical : Vapors may cause a flash fire or ignite explosively. Vapors may travel considerable distance to a source of ignition and flash back. Prevent buildup of vapors or gases to explosive concentrations. Vapor from the solvent may accumulate in container headspace resulting in flammability hazard. Heat may cause the containers to explode.

Special protective equipment and precautions for firefighters

Special firefighting procedures : Use water spray to keep fire-exposed containers cool. Water may be ineffective in fighting the fire. Fight fire from a protected location. Move containers from fire area if you can do so without risk.

Special protective equipment for fire-fighters : Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA.

6. ACCIDENTAL RELEASE MEASURES:

Personal precautions, protective equipment and emergency procedures : ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Avoid breathing mists or vapors. Keep upwind. Ventilate closed spaces before entering them. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Keep unauthorized personnel away.

Methods and material for containment and cleaning up : Eliminate all ignition sources if safe to do so. Use only non-sparking tools. Take precautionary measures against static discharges. Stop leak if possible without any risk. Absorb spill with vermiculite or other inert material, then place in a container for chemical waste. Clean surface thoroughly to remove residual contamination. Dike far ahead of larger spill for later recovery and disposal.

Notification Procedures : Prevent entry into waterways, sewer, basements or confined areas. Inform authorities if large amounts are involved.

Environmental precautions : Do not contaminate water sources or sewer. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground.

7. HANDLING AND STORAGE:

Precautions for safe handling : Do not handle until all safety precautions have been read and understood. DO NOT handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. Take precautionary measures against static discharges. Ground/bond container and receiving equipment. Use explosion-proof electrical/ventilating/lighting/equipment. Use only non-sparking tools. Wear protective gloves/protective clothing/eye

Protection / face protection. Avoid contact with eyes, skin, and clothing. Do not breathe mist or vapor. Use only with adequate ventilation. Wash hands thoroughly after handling.

Conditions for safe storage, including any incompatibilities : Keep away from food, drink and animal feeding stuffs. Keep container tightly closed in a dry, well-ventilated place. Ground container and transfer equipment to eliminate static electric sparks. Comply with all national, state, and local codes pertaining to the storage, handling, dispensing, and disposal of flammable liquids.

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8. EXPOSURE CONTROLS PERSONAL PROTECTION:

Control parameters

Ingredients with workplace control parameters:-

Derived No Effect Level (DNEL)

Application Area	Routes of exposure	Health effect	Value
Workers	Inhalation	Long-term local effects	144 mg/m ³
Workers	Inhalation	Long-term systemic effects	73 mg/m ³
Workers	Skin contact	Long-term systemic effects	21 mg/m ³

Predicted No Effect Concentration (PNEC)

Compartment	Value
Soil	0,153 mg/kg
Sea water	0,67 mg/l
Fresh water	10 mg/l
Fresh water sediment	37 mg/kg
Sewage treatment plant	2700 mg/l
Aquatic intermittent release	10 mg/l

Appropriate engineering controls

: No data available

Individual protection measures, such as personal protective equipment

General information

: Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. An eye wash and safety shower must be available in the immediate work area. Use explosion-proof ventilation equipment.

Eye/face protection

: Wear safety glasses with side shields (or goggles).

Hand protection

: Chemical resistant gloves.

Other

: Wear suitable protective clothing.

Respiratory protection

: In case of inadequate ventilation use suitable respirator. Chemical Respirator with organic vapor cartridge.

Hygiene measures

: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Provide eyewash station and safety shower. Avoid contact with eyes, skin, and clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES:

Appearance

: Clear, colorless liquid

Odor

: Characteristic

Solubility

: Miscible in water.

Formula

: C₄H₈O₂

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Molecular Weight	:	88.11 g/mol
Specific Gravity	:	1.030 - 1.035 g/cm ³ at 25°C
pH	:	6,0 - 8 at 500 g/l at 20 °C
% Volatiles by volume @ 21C (70F)	:	No data available.
Boiling Point	:	100.0 - 102.0 °C
Freezing point	:	NLT 10 °C
Flash Point	:	11 °C
Vapor Density (Air=1)	:	3,04
Vapor Pressure (mm Hg)	:	36 hPa at 20 °C 53 hPa at 25,20 °C
Evaporation Rate (BuAc=1)	:	No data available.

10. STABILITY AND REACTIVITY:

Reactivity	:	Formation of peroxides possible. Vapors may form explosive mixture with air.
Chemical stability	:	Material is stable under ambient conditions..
Possibility of hazardous reactions	:	Hazardous polymerization does not occur.
Conditions to avoid	:	Warming. Moisture.
Incompatible materials	:	No data available.
Hazardous decomposition products	:	In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION:

Information on likely routes of exposure

Ingestion	:	No data available.
Inhalation	:	No data available.
Skin contact	:	No data available.
Eye contact	:	Eye irritation.

Information on toxicological effects

Acute toxicity (list all possible routes of exposure)

Oral Product	:	LD 50 Rat - male and female - 5.150 mg/kg.
Dermal Product	:	LD 50 Rabbit - 7.378 mg/kg.

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Inhalation Product	:	No data available.
Repeated dose toxicity Product	:	No data available.
Skin corrosion/irritation Product	:	Prolonged or repeated skin contact may cause drying, cracking, or irritation
Serious eye damage/eye irritation Product	:	Irritating to eyes.
Respiratory or skin sensitization Product	:	Not a skin sensitizer.
Carcinogenicity Product	:	Presumed to have carcinogenic potential for humans
IARC Monographs on the Evaluation of Carcinogenic Risks to Humans	:	No carcinogenic components identified.
US. National Toxicology Program (NTP) Report on Carcinogens	:	No carcinogenic components identified.
US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)	:	No carcinogenic components identified.
Germ cell mutagenicity	:	
In vitro Product	:	No data available.
Reproductive toxicity Product	:	No components toxic to reproduction.
Specific target organ toxicity - single exposure Product	:	May cause respiratory irritation. - Respiratory system
Specific target organ toxicity - repeated exposure Product	:	No data available.
Aspiration hazard Product	:	No data available.
Other effects	:	No data available.

12. ECOLOGICAL INFORMATION:**Ecotoxicity****Acute hazards to the aquatic environment**

Fish Product	:	NOEC - Pimephales promelas (fathead minnow) - > 103 mg/l
Aquatic invertebrates Product	:	EC50 - Daphnia magna (Water flea) - > 1.000 mg/l
Toxicity to algae	:	ErC50 - Pseudokirchneriella subcapitata (green algae) - > 1.000 mg/l

Chronic hazards to the aquatic environment

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Fish Product	:	No data available.
Aquatic invertebrates Product	:	No data available.
Toxicity to Aquatic Plants Product:	:	No data available.
Persistence and degradability		
Biodegradation Product	:	< 10 % - Not readily biodegradable.
BOD/COD ratio Product	:	No data available.
Bioaccumulative potential		
Bioconcentration factor (BCF) Product	:	No data available on bioaccumulation.
Partition coefficient n-octanol / water (log Kow) Product	:	No data available.
Mobility in soil	:	No data available.
Other adverse effects	:	Forms toxic mixtures in water, dilution measures notwithstanding. Discharge into the environment must be avoided.

13. DISPOSAL CONSIDERATION:

Disposal instructions	:	Discharge, treatment, or disposal may be subject to national, state, or local laws. Disposal recommendations are based on uncontaminated material.
Contaminated packaging	:	Since emptied containers retain product residue, follow label warnings even after container is emptied.

14. TRANSPORT INFORMATION:

	UN No.	UN proper shipping name	Hazard Class(es)	Packaging group	Marine Pollutant
DOT	UN 1165	1,4 Dioxane	3	II	No
IMDG	UN 1165	1,4 Dioxane	3	II	No
IATA	UN 1165	1,4 Dioxane	3	II	No

15. REGULATORY INFORMATION:

This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006.
Safety, health and environmental regulations/legislation specific for the substance or mixture
No Data Available.

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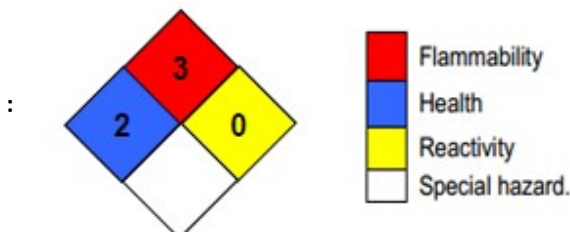
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16. OTHER INFORMATION:

NFPA Hazard ID



Hazard rating: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe

Issue Date : 11/07/2023

Version : 01

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