



# SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Revision Date 04/04/2014

Version 1.1

## SECTION 1. Identification

### Product identifier

Product number	DX2090
Product name	p-Dioxane GR ACS
CAS-No.	123-91-1

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

Identified uses	Reagent for analysis
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### Details of the supplier of the safety data sheet

Company	EMD Millipore Corporation   290 Concord Road, Billerica, MA 01821, United States of America   General Inquiries: +1-978-715-4321   Monday to Friday, 9:00 AM to 4:00 PM Eastern Time (GMT-5)
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Emergency telephone	800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week
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## SECTION 2. Hazards identification

### GHS Classification

Flammable liquid, Category 2, H225  
Eye irritation, Category 2, H319  
Carcinogenicity, Category 2, H351  
Specific target organ systemic toxicity - single exposure, Category 3, Respiratory system, H335  
For the full text of the H-Statements mentioned in this Section, see Section 16.

### GHS-Labeling

#### Hazard pictograms



Signal Word  
Danger

#### Hazard Statements

H225 Highly flammable liquid and vapor.  
H319 Causes serious eye irritation.

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H335 May cause respiratory irritation.  
H351 Suspected of causing cancer.

### *Precautionary Statements*

P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.  
P240 Ground/bond container and receiving equipment.  
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.  
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

### **OSHA Hazards**

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200). This information is based on 29 CFR 1910.1200 criteria prior to adoption of the GHS and may deviate from the GHS information.

### **Other hazards**

None known.

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### **SECTION 3. Composition/information on ingredients**

Formula	C <sub>4</sub> H <sub>8</sub> O <sub>2</sub> (Hill)
Molar mass	88.11 g/mol

### **Hazardous ingredients**

*Chemical Name (Concentration)*

CAS-No.

*1,4-Dioxane (>= 90 % - <= 100 % )*

123-91-1

Exact percentages are being withheld as a trade secret.

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### **SECTION 4. First aid measures**

#### **Description of first-aid measures**

*Inhalation*

After inhalation: fresh air. Consult a physician.

*Skin contact*

After skin contact: wash off with plenty of water. Remove contaminated clothing. Consult a physician.

*Eye contact*

After eye contact: rinse out with plenty of water. Call in ophthalmologist.

*Ingestion*

After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.

Never give anything by mouth to an unconscious person.

#### **Most important symptoms and effects, both acute and delayed**

irritant effects, Cough, Shortness of breath, Dizziness, Nausea, Vomiting, Headache  
Drying-out effect resulting in rough and chapped skin.

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### Indication of any immediate medical attention and special treatment needed

Laxative: Sodium sulfate (1 tablespoon/1/4 l water).

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## SECTION 5. Fire-fighting measures

### Extinguishing media

#### *Suitable extinguishing media*

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

#### *Unsuitable extinguishing media*

For this substance/mixture no limitations of extinguishing agents are given.

### Special hazards arising from the substance or mixture

Combustible material

Vapors are heavier than air and may spread along floors.

Development of hazardous combustion gases or vapors possible in the event of fire.

Forms explosive mixtures with air at ambient temperatures.

Pay attention to flashback.

### Advice for firefighters

#### *Special protective equipment for fire-fighters*

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

#### *Further information*

Remove container from danger zone and cool with water. Prevent fire extinguishing water from contaminating surface water or the ground water system.

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## SECTION 6. Accidental release measures

### Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Avoid substance contact. Do not breathe vapors, aerosols. Ensure adequate ventilation. Keep away from heat and sources of ignition. Evacuate the danger area, observe emergency procedures, consult an expert.

Advice for emergency responders: Protective equipment see section 8.

### Environmental precautions

Do not empty into drains. Risk of explosion.

### Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills.

Observe possible material restrictions (see sections 7 and 10).

Take up with liquid-absorbent material (e.g. Chemisorb®). Dispose of properly. Clean up affected area.

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## SECTION 7. Handling and storage

### Precautions for safe handling

Work under hood. Do not inhale substance/mixture. Avoid generation of vapors/aerosols.

Observe label precautions.

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### *Advice on protection against fire and explosion*

Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge.

### **Conditions for safe storage, including any incompatibilities**

Keep away from heat and sources of ignition. Keep container tightly closed in a dry and well-ventilated place.

No declaration

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## **SECTION 8. Exposure controls/personal protection**

### **Exposure limit(s)**

#### *Ingredients*

Basis	Value	Threshold limits	Remarks
<i>1,4-Dioxane 123-91-1</i>			
ACGIH	Time Weighted Average (TWA): Skin designation:	20 ppm	Can be absorbed through the skin.
NIOSH/GUIDE	Ceiling Limit Value and Time Period (if specified):	1 ppm 3.6 mg/m <sup>3</sup>	Ceiling Limit Value 30-min
OSHA_TRANS	PEL:  Skin designation:	100 ppm 360 mg/m <sup>3</sup>	Can be absorbed through the skin.
Z1A	Time Weighted Average (TWA):  Skin designation (Final Rule Limit applies):	25 ppm 90 mg/m <sup>3</sup>	Can be absorbed through the skin.

### **Engineering measures**

Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

### **Individual protection measures**

Protective clothing should be selected specifically for the workplace, depending on concentration and quantity of the hazardous substances handled. The chemical resistance of the protective equipment should be inquired at the respective supplier.

#### *Hygiene measures*

Immediately change contaminated clothing. Apply skin- protective barrier cream. Wash hands and face after working with substance.

#### *Eye/face protection*

Safety glasses

#### *Hand protection*

Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

#### *Other protective equipment:*

Flame retardant antistatic protective clothing

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## *Respiratory protection*

required when vapors/aerosols are generated.

Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

## SECTION 9. Physical and chemical properties

Physical state	liquid
Color	colorless
Odor	ether-like
Odor Threshold	169.2 ppm
pH	6 - 8 at 500 g/l 68 °F (20 °C)
Melting point	12 °C
Boiling point/boiling range	214.7 °F (101.5 °C) at 1,013 hPa
Flash point	52 °F (11 °C) Method: c.c.
Evaporation rate	No information available.
Flammability (solid, gas)	No information available.
Lower explosion limit	1.7 %(V)
Upper explosion limit	25.2 %(V)
Vapor pressure	41 hPa at 68 °F (20 °C)
Relative vapor density	3.03
Density	1.03 g/cm <sup>3</sup> at 68 °F (20 °C)
Relative density	No information available.
Water solubility	at 68 °F (20 °C) soluble

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Partition coefficient: n-octanol/water

log Pow: -0.27  
(experimental)  
(Lit.) Bioaccumulation is not expected.

Autoignition temperature

No information available.

Decomposition temperature

No information available.

Viscosity, dynamic

1.32 mPa.s  
at 68 °F (20 °C)

Explosive properties

Not classified as explosive.

Oxidizing properties

none

Ignition temperature

572 °F (300 °C)  
Method: DIN 51794

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## SECTION 10. Stability and reactivity

### Reactivity

Vapors may form explosive mixture with air.  
Formation of peroxides possible.

### Chemical stability

Sensitive to air.

#### *Stabilizer*

butyl hydroxytoluene (BHT)

### Possibility of hazardous reactions

Risk of ignition or formation of inflammable gases or vapors with:  
fire-promoting substances, Hydrogen, Raney-nickel

Exothermic reaction with:

Oxidizing agents, Sulfur trioxide, acids

Risk of explosion with:

Raney-nickel, Hydrogen, Nitric acid, perchlorates, triethylaluminum

### Conditions to avoid

Distillation (Risk of explosion).

Warming.

### Incompatible materials

various plastics, copper compounds

### Hazardous decomposition products

Peroxides

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## SECTION 11. Toxicological information

### Information on toxicological effects

#### *Likely route of exposure*

Inhalation, Eye contact, Skin contact

#### *Target Organs*

Eyes

Skin

Respiratory system

Liver

Kidneys

#### *Acute oral toxicity*

LD50 rat: 5,200 mg/kg

OECD Test Guideline 401

#### *Acute inhalation toxicity*

LC50 rat: 48.5 - 54.3 mg/l; 4 h

OECD Test Guideline 403

Symptoms: mucosal irritations, Cough, Shortness of breath, Possible damages:, damage of respiratory tract

Irritating to respiratory system.

#### *Acute dermal toxicity*

LD50 rabbit: 7,600 mg/kg

(IUCLID)

absorption

#### *Skin irritation*

rabbit

Result: No irritation

(IUCLID)

Repeated exposure may cause skin dryness or cracking.

#### *Eye irritation*

rabbit

Result: Eye irritation

(IUCLID)

Causes serious eye irritation.

#### *Sensitization*

Sensitization test: guinea pig

Result: negative

(IUCLID)

#### *Genotoxicity in vitro*

Ames test

Result: negative

(IUCLID)

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Mutagenicity (mammal cell test):  
Result: negative  
Method: OECD Test Guideline 476

#### *CMR effects*

Carcinogenicity:  
Suspected of causing cancer.

#### *Specific target organ systemic toxicity - single exposure*

May cause respiratory irritation.

#### *Specific target organ systemic toxicity - repeated exposure*

The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

#### *Aspiration hazard*

Regarding the available data the classification criteria are not fulfilled.

### **Carcinogenicity**

IARC	Group 2B: Possibly carcinogenic to humans 1,4-Dioxane	123-91-1
OSHA	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.	
NTP	Anticipated carcinogen. 1,4-Dioxane	123-91-1
ACGIH	Confirmed animal carcinogen with unknown relevance to humans. 1,4-Dioxane	123-91-1

### **Further information**

The substance has delayed effects.

Systemic effects:

After absorption:

Headache, Dizziness, Nausea, Vomiting

Absorption can result in damage to:

Liver, Kidney

Handle in accordance with good industrial hygiene and safety practice.

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## **SECTION 12. Ecological information**

### **Ecotoxicity**

#### *Toxicity to fish*

LC50 Pimephales promelas (fathead minnow): 9,850 mg/l; 96 h (ECOTOX Database)

#### *Toxicity to daphnia and other aquatic invertebrates*

EC50 Daphnia: 8,450 mg/l; 24 h (IUCLID)

EC5 E.sulcatum: 5,340 mg/l; 72 h (IUCLID) (maximum permissible toxic concentration)

#### *Toxicity to algae*

IC5 Scenedesmus quadricauda (Green algae): 5,600 mg/l; 8 d (IUCLID) (maximum permissible toxic concentration)

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### *Toxicity to bacteria*

EC50 *Pseudomonas putida*: 2,700 mg/l; 16 h  
OECD Test Guideline 209

### **Persistence and degradability**

#### *Biodegradability*

< 5 %; 28 d  
OECD Test Guideline 301E  
Not readily biodegradable.

### **Bioaccumulative potential**

#### *Partition coefficient: n-octanol/water*

log Pow: -0.27  
(experimental)  
(Lit.) Bioaccumulation is not expected.

### **Mobility in soil**

No information available.

### *Additional ecological information*

Forms toxic mixtures in water, dilution measures notwithstanding.  
Discharge into the environment must be avoided.

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## **SECTION 13. Disposal considerations**

The information presented only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. Disposal should be in accordance with applicable regional, national and local laws and regulations.

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## **SECTION 14. Transport information**

### **Land transport (DOT)**

UN number	UN 1165
Proper shipping name	DIOXANE
Class	3
Packing group	II
Environmentally hazardous	--

### **Air transport (IATA)**

UN number	UN 1165
Proper shipping name	DIOXANE
Class	3
Packing group	II
Environmentally hazardous	--
Special precautions for user	no

### **Sea transport (IMDG)**

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UN number UN 1165  
Proper shipping name DIOXANE  
Class 3  
Packing group II  
Environmentally hazardous --  
Special precautions for user yes  
EmS F-E S-D

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## SECTION 15. Regulatory information

### United States of America

#### OSHA Hazards

Flammable Liquid  
Eye irritant  
Respiratory irritant  
Carcinogen  
Target organ effects

This information is based on 29 CFR 1910.1200 criteria prior to adoption of the GHS, and may deviate from the GHS information on the label and in section 2.

#### SARA 311/312 Hazards

Fire Hazard  
Acute Health Hazard  
Chronic Health Hazard

#### SARA 313

The following components are subject to reporting levels established by SARA Title III, Section 313:

##### *Ingredients*

1,4-Dioxane	123-91-1	99.9975 %
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#### SARA 302

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

#### Clean Water Act

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.

This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.

#### DEA List I

Not listed

#### DEA List II

Not listed

### US State Regulations

#### Massachusetts Right To Know

*Ingredients*

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1,4-Dioxane

## Pennsylvania Right To Know

*Ingredients*

1,4-Dioxane

## New Jersey Right To Know

*Ingredients*

1,4-Dioxane

## California Prop 65 Components

WARNING: this product contains a chemical known in the State of California to cause cancer.

*Ingredients*

1,4-Dioxane

## Notification status

TSCA:

All components of the product are listed in the TSCA-inventory.

DSL:

All components of this product are on the Canadian DSL.

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## SECTION 16. Other information

### Training advice

Provide adequate information, instruction and training for operators.

### Full text of H-Statements referred to under sections 2 and 3.

H225	Highly flammable liquid and vapor.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H351	Suspected of causing cancer.

### Key or legend to abbreviations and acronyms used in the safety data sheet

Used abbreviations and acronyms can be looked up at [www.wikipedia.org](http://www.wikipedia.org).

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The information contained herein is based on the present state of our knowledge. It characterizes the product with regard to appropriate safety precautions. It does not represent a warranty of any product properties and we assume no liability for any loss or injury which may result from the use of this information. Users should conduct their own investigations to determine the suitability of the information.

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