



## SAFETY DATA SHEET

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

Date of issue: 04/03/2014

Version 1.0

### SECTION 1. Identification

#### Product identifier

Product number	TX0277
Product name	Tetrahydrofuran Anhydrous  Unstabilized DriSolv®
CAS-No.	109-99-9

#### 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  
Carcinogenicity, Category 2, H351  
Eye irritation, Category 2, H319  
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 (Hill)

Molar mass 72.11 g/mol

### **Hazardous ingredients**

*Chemical Name (Concentration)*

CAS-No.

*tetrahydrofuran (>= 90 % - <= 100 % )*

109-99-9

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. Call in 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, narcosis, drowsiness

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

No information available.

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## SECTION 5. Fire-fighting measures

### Extinguishing media

*Suitable extinguishing media*

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

*Unsuitable extinguishing media*

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

### Special hazards arising from the substance or mixture

Combustible.

Vapors are heavier than air and may spread along floors.

Forms explosive mixtures with air at ambient temperatures.

Pay attention to flashback.

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

### 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

Observe label precautions.

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

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

No declaration

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

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

#### *Ingredients*

Basis	Value	Threshold limits	Remarks
<i>tetrahydrofuran</i>	<i>109-99-9</i>		
ACGIH	Time Weighted Average (TWA): Skin designation:	50 ppm	Can be absorbed through the skin.
	Short Term Exposure Limit (STEL):	100 ppm	
NIOSH/GUIDE	Recommended exposure limit (REL):	200 ppm 590 mg/m <sup>3</sup>	
	Short Term Exposure Limit (STEL):	250 ppm 735 mg/m <sup>3</sup>	
OSHA_TRANS	PEL:	200 ppm 590 mg/m <sup>3</sup>	
Z1A	Short Term Exposure Limit (STEL):	250 ppm 735 mg/m <sup>3</sup>	
	Time Weighted Average (TWA):	200 ppm 590 mg/m <sup>3</sup>	

### **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

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### *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

### *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.

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## SECTION 9. Physical and chemical properties

Physical state	liquid
Color	colorless
Odor	ether-like
Odor Threshold	2.0 - 59.0 ppm
pH	7 - 8 at 200 g/l 68 °F (20 °C)
Melting point	-108.5 °C
Boiling point/boiling range	149 - 151 °F (65 - 66 °C) at 1,013 hPa
Flash point	-4 °F (-20 °C) Method: c.c.
Evaporation rate	No information available.
Flammability (solid, gas)	No information available.
Lower explosion limit	1.5 %(V)
Upper explosion limit	12.4 %(V)
Vapor pressure	173 hPa at 68 °F (20 °C)
Relative vapor density	2.5
Density	0.89 g/cm <sup>3</sup> at 68 °F (20 °C)
Relative density	No information available.

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Water solubility	at 68 °F (20 °C) soluble
Partition coefficient: n-octanol/water	log Pow: 0.45 (25 °C) OECD Test Guideline 107 Bioaccumulation is not expected.
Autoignition temperature	No information available.
Decomposition temperature	No information available.
Viscosity, dynamic	0.47 mPa.s at 68 °F (20 °C)
Explosive properties	Not classified as explosive.
Oxidizing properties	none
Ignition temperature	419 °F (215 °C)

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### SECTION 10. Stability and reactivity

#### Reactivity

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

#### Chemical stability

Sensitivity to light  
Sensitive to air.  
The product is chemically stable under standard ambient conditions (room temperature) .

#### Possibility of hazardous reactions

A risk of explosion and/or of toxic gas formation exists with the following substances:  
alkali hydroxides, hydrides, Oxidizing agents, Bromine  
Oxygen

#### Conditions to avoid

Warming.  
Warming.

#### Incompatible materials

rubber, various plastics, Tin

#### Hazardous decomposition products

Peroxides  
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

Respiratory system

Central nervous system

*Acute oral toxicity*

LD50 rat: 1,650 mg/kg (RTECS) (Regulation (EC) No 1272/2008, Annex VI)

Symptoms: Irritation of mucous membranes

*Acute inhalation toxicity*

LC50 rat: 53.9 mg/l; 4 h (IUCLID)

Irritating to respiratory system.

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

*Acute dermal toxicity*

absorption

*Skin irritation*

rabbit

Result: Irritations

(IUCLID) (Regulation (EC) No 1272/2008, Annex VI)

Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product.

*Eye irritation*

rabbit

Result: Eye irritation

(IUCLID)

Causes serious eye irritation.

*Sensitization*

Sensitization test: guinea pig

Result: negative

(IUCLID)

Human experience

Result: negative

(IUCLID)

*Genotoxicity in vitro*

Ames test

Result: negative

(IUCLID)

*Reproductive toxicity*

No impairment of reproductive performance suspected. (Lit.)

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*CMR effects*

Carcinogenicity:

Suspected of causing cancer.

*Specific target organ systemic toxicity - single exposure*

Target Organs: Respiratory system

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	No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
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	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
ACGIH	Confirmed animal carcinogen with unknown relevance to humans.
	tetrahydrofuran 109-99-9

**Further information**

In high doses:

drowsiness, narcosis

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): 2,160 mg/l; 96 h (in soft water) (IUCLID)

*Toxicity to daphnia and other aquatic invertebrates*

EC50 Daphnia magna (Water flea): 382 mg/l; 24 h (IUCLID)

*Toxicity to algae*

IC5 Scenedesmus quadricauda (Green algae): 3,700 mg/l; 8 d (maximum permissible toxic concentration) (IUCLID)

*Toxicity to bacteria*

EC5 Pseudomonas putida: 580 mg/l; 16 h (maximum permissible toxic concentration) (IUCLID)

**Persistence and degradability**



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### *Biodegradability*

39 %; 28 d

OECD Test Guideline 301D

Not readily biodegradable.

### **Bioaccumulative potential**

*Partition coefficient: n-octanol/water*

log Pow: 0.45 (25 °C)

OECD Test Guideline 107

Bioaccumulation is not expected.

### **Mobility in soil**

No information available.

### *Additional ecological information*

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 2056
Proper shipping name	TETRAHYDROFURAN
Class	3
Packing group	II
Environmentally hazardous	--

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

UN number	UN 2056
Proper shipping name	TETRAHYDROFURAN
Class	3
Packing group	II
Environmentally hazardous	--
Special precautions for user	no

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

UN number	UN 2056
Proper shipping name	TETRAHYDROFURAN
Class	3
Packing group	II
Environmentally hazardous	--
Special precautions for user	yes

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EmS

F-E S-D

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**SECTION 15. Regulatory information**

**United States of America**

**OSHA Hazards**

Flammable Liquid  
Harmful if swallowed.  
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**

SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

**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*  
tetrahydrofuran

**Pennsylvania Right To Know**

*Ingredients*  
tetrahydrofuran

**New Jersey Right To Know**

*Ingredients*  
tetrahydrofuran

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### California Prop 65 Components

This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

### 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).

Date of issue: 04/03/2014

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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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