

## SAFETY DATA SHEET

Creation Date 09-May-2012

Revision Date 25-Apr-2019

Revision Number 5

### 1. Identification

**Product Name** Hydrogen chloride, 4N solution in 1,4-dioxane

**Cat No. :** AC388360000; AC388361000; AC388368000

**Synonyms** No information available

**Recommended Use** Laboratory chemicals.  
**Uses advised against** Food, drug, pesticide or biocidal product use.

**Details of the supplier of the safety data sheet**

**Company**

Fisher Scientific	Acros Organics
One Reagent Lane	One Reagent Lane
Fair Lawn, NJ 07410	Fair Lawn, NJ 07410
Tel: (201) 796-7100	

**Emergency Telephone Number**

For information **US** call: 001-800-ACROS-01 / **Europe** call: +32 14 57 52 11

Emergency Number **US**:001-201-796-7100 / **Europe**: +32 14 57 52 99

**CHEMTREC** Tel. No.**US**:001-800-424-9300 / **Europe**:001-703-527-3887

### 2. Hazard(s) identification

**Classification**

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

Flammable liquids	Category 2
Acute Inhalation Toxicity - Vapors	Category 4
Skin Corrosion/Irritation	Category 1 A
Serious Eye Damage/Eye Irritation	Category 1
Carcinogenicity	Category 1B
Specific target organ toxicity (single exposure)	Category 3
Target Organs - Respiratory system.	
Specific target organ toxicity - (repeated exposure)	Category 2
Target Organs - Liver, Kidney.	

**Label Elements**

**Signal Word**

Danger

**Hazard Statements**

Highly flammable liquid and vapor

Harmful if inhaled  
 Causes severe skin burns and eye damage  
 May cause respiratory irritation  
 May cause cancer  
 May cause damage to organs through prolonged or repeated exposure



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

#### Response

Immediately call a POISON CENTER or doctor/physician

#### Inhalation

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

#### Skin

IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower  
 Wash contaminated clothing before reuse

#### Eyes

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

#### Ingestion

IF SWALLOWED: Rinse mouth. DO NOT induce vomiting

#### Fire

In case of fire: Use CO<sub>2</sub>, dry chemical, or foam for extinction

#### Storage

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

#### Disposal

Dispose of contents/container to an approved waste disposal plant

#### Hazards not otherwise classified (HNOC)

May form explosive peroxides  
 Repeated exposure may cause skin dryness or cracking  
 WARNING. Cancer - <https://www.p65warnings.ca.gov/>.

## 3. Composition/Information on Ingredients

Component	CAS-No	Weight %
1,4-Dioxane	123-91-1	85
Hydrogen chloride	7647-01-0	15

## 4. First-aid measures

<b>General Advice</b>	Show this safety data sheet to the doctor in attendance. Immediate medical attention is required.
<b>Eye Contact</b>	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Immediate medical attention is required.
<b>Skin Contact</b>	Wash off immediately with plenty of water for at least 15 minutes. Immediate medical attention is required.
<b>Inhalation</b>	If breathing is difficult, give oxygen. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Remove to fresh air. Immediate medical attention is required.
<b>Ingestion</b>	Do NOT induce vomiting. Call a physician or poison control center immediately.
<b>Most important symptoms and effects</b>	Causes burns by all exposure routes. . Difficulty in breathing. Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated: Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation: Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting
<b>Notes to Physician</b>	Treat symptomatically

## 5. Fire-fighting measures

<b>Suitable Extinguishing Media</b>	Water spray, carbon dioxide (CO <sub>2</sub> ), dry chemical, alcohol-resistant foam. Water mist may be used to cool closed containers.
<b>Unsuitable Extinguishing Media</b>	No information available
<b>Flash Point</b>	17 °C / 62.6 °F
<b>Method -</b>	No information available
<b>Autoignition Temperature</b>	No information available
<b>Explosion Limits</b>	
<b>Upper</b>	No data available
<b>Lower</b>	No data available
<b>Sensitivity to Mechanical Impact</b>	No information available
<b>Sensitivity to Static Discharge</b>	No information available

### Specific Hazards Arising from the Chemical

Flammable. Corrosive material. Risk of ignition. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Containers may explode when heated. Thermal decomposition can lead to release of irritating gases and vapors. Keep product and empty container away from heat and sources of ignition.

### Hazardous Combustion Products

Carbon monoxide (CO). Carbon dioxide (CO<sub>2</sub>). Thermal decomposition can lead to release of irritating gases and vapors. Hydrogen chloride gas.

### Protective Equipment and Precautions for Firefighters

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

### NFPA

**Health**  
3

**Flammability**  
3

**Instability**  
1

**Physical hazards**  
N/A

## 6. Accidental release measures

<b>Personal Precautions</b>	Wear self-contained breathing apparatus and protective suit. Evacuate personnel to safe areas. Remove all sources of ignition. Ensure adequate ventilation. Take precautionary measures against static discharges. Do not get in eyes, on skin, or on clothing.
<b>Environmental Precautions</b>	Should not be released into the environment. See Section 12 for additional Ecological Information.
<b>Methods for Containment and Clean Up</b>	Wear self-contained breathing apparatus and protective suit. Remove all sources of ignition. Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. Use spark-proof tools and explosion-proof equipment.

## 7. Handling and storage

<b>Handling</b>	Use only under a chemical fume hood. Wear personal protective equipment/face protection. Do not get in eyes, on skin, or on clothing. Do not breathe mist/vapors/spray. Do not ingest. If swallowed then seek immediate medical assistance. Keep away from open flames, hot surfaces and sources of ignition. Use spark-proof tools and explosion-proof equipment. Take precautionary measures against static discharges. If peroxide formation is suspected, do not open or move container. Use only non-sparking tools. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded.
<b>Storage</b>	Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat, sparks and flame. Flammables area. 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.

## 8. Exposure controls / personal protection

### Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH	Mexico OEL (TWA)
1,4-Dioxane	TWA: 20 ppm Skin	(Vacated) TWA: 25 ppm (Vacated) TWA: 90 mg/m <sup>3</sup> Skin TWA: 100 ppm TWA: 360 mg/m <sup>3</sup>	IDLH: 500 ppm Ceiling: 1 ppm Ceiling: 3.6 mg/m <sup>3</sup>	TWA: 20 ppm
Hydrogen chloride	Ceiling: 2 ppm	Ceiling: 5 ppm Ceiling: 7 mg/m <sup>3</sup> (Vacated) Ceiling: 5 ppm (Vacated) Ceiling: 7 mg/m <sup>3</sup>	IDLH: 50 ppm Ceiling: 5 ppm Ceiling: 7 mg/m <sup>3</sup>	Ceiling: 2 ppm

### Legend

ACGIH - American Conference of Governmental Industrial Hygienists

OSHA - Occupational Safety and Health Administration

NIOSH IDLH: NIOSH - National Institute for Occupational Safety and Health

<b>Engineering Measures</b>	Use only under a chemical fume hood. Use explosion-proof electrical/ventilating/lighting/equipment. Ensure that eyewash stations and safety showers are close to the workstation location. Ensure adequate ventilation, especially in confined areas.
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### Personal Protective Equipment

<b>Eye/face Protection</b>	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.
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<b>Skin and body protection</b>	Wear appropriate protective gloves and clothing to prevent skin exposure.
<b>Respiratory Protection</b>	Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.
<b>Hygiene Measures</b>	Handle in accordance with good industrial hygiene and safety practice.

## 9. Physical and chemical properties

<b>Physical State</b>	Liquid
<b>Appearance</b>	Clear
<b>Odor</b>	No information available
<b>Odor Threshold</b>	No information available
<b>pH</b>	No information available
<b>Melting Point/Range</b>	No data available
<b>Boiling Point/Range</b>	No information available
<b>Flash Point</b>	17 °C / 62.6 °F
<b>Evaporation Rate</b>	No information available
<b>Flammability (solid,gas)</b>	Not applicable
<b>Flammability or explosive limits</b>	
<b>Upper</b>	No data available
<b>Lower</b>	No data available
<b>Vapor Pressure</b>	No information available
<b>Vapor Density</b>	No information available
<b>Specific Gravity</b>	1.050
<b>Solubility</b>	Soluble in water
<b>Partition coefficient; n-octanol/water</b>	No data available
<b>Autoignition Temperature</b>	No information available
<b>Decomposition Temperature</b>	No information available
<b>Viscosity</b>	No information available
<b>Molecular Formula</b>	Cl H
<b>Molecular Weight</b>	36.45

## 10. Stability and reactivity

<b>Reactive Hazard</b>	None known, based on information available
<b>Stability</b>	Hygroscopic. May form explosive peroxides.
<b>Conditions to Avoid</b>	Incompatible products. Excess heat. Keep away from open flames, hot surfaces and sources of ignition. Exposure to moist air or water.
<b>Incompatible Materials</b>	Bases, Strong oxidizing agents, Amines, Halogens, oxygen, Metals, Reducing Agent
<b>Hazardous Decomposition Products</b>	Carbon monoxide (CO), Carbon dioxide (CO <sub>2</sub> ), Thermal decomposition can lead to release of irritating gases and vapors, Hydrogen chloride gas
<b>Hazardous Polymerization</b>	Hazardous polymerization does not occur.
<b>Hazardous Reactions</b>	None under normal processing.

## 11. Toxicological information

### Acute Toxicity

#### Product Information

<b>Oral LD50</b>	Based on ATE data, the classification criteria are not met.
<b>Dermal LD50</b>	Based on ATE data, the classification criteria are not met.
<b>Vapor LC50</b>	Category 4.

**Component Information**

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
1,4-Dioxane	5170 mg/kg ( Rat ) 4200 mg/kg ( Rat )	LD50 = 7600 mg/kg ( Rabbit )	48.5 mg/L ( Rat ) 4 h
Hydrogen chloride	238 - 277 mg/kg ( Rat )	> 5010 mg/kg ( Rabbit )	1.68 mg/L ( Rat ) 1 h

**Toxicologically Synergistic Products** No information available

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

**Irritation** Causes burns by all exposure routes

**Sensitization** No information available

**Carcinogenicity** The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
1,4-Dioxane	123-91-1	Group 2B	Reasonably Anticipated	A3	X	A3
Hydrogen chloride	7647-01-0	Not listed	Not listed	Not listed	Not listed	Not listed

*IARC (International Agency for Research on Cancer)*

*IARC (International Agency for Research on Cancer)*

*Group 1 - Carcinogenic to Humans*

*Group 2A - Probably Carcinogenic to Humans*

*Group 2B - Possibly Carcinogenic to Humans*

*NTP: (National Toxicity Program)*

*NTP: (National Toxicity Program)*

*Known - Known Carcinogen*

*Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen*

*ACGIH: (American Conference of Governmental Industrial Hygienists)*

*A1 - Known Human Carcinogen*

*A2 - Suspected Human Carcinogen*

*A3 - Animal Carcinogen*

*ACGIH: (American Conference of Governmental Industrial Hygienists)*

**Mutagenic Effects** Mutagenic effects have occurred in experimental animals.

**Reproductive Effects** Experiments have shown reproductive toxicity effects on laboratory animals.

**Developmental Effects** No information available.

**Teratogenicity** No information available.

**STOT - single exposure** Respiratory system

**STOT - repeated exposure** Liver Kidney

**Aspiration hazard** No information available

**Symptoms / effects, both acute and delayed** Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated: Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation: Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting

**Endocrine Disruptor Information** No information available

**Other Adverse Effects** See actual entry in RTECS for complete information.

## 12. Ecological information

### Ecotoxicity

This product contains the following substance(s) which are hazardous for the environment.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
1,4-Dioxane	Not listed	LC50: = 9850 mg/L, 96h (Pimephales promelas)	EC50 = 610 mg/L 5 min EC50 = 668 mg/L 15 min	EC50 = 163 mg/L 48h

		LC50: 10306 - 14742 mg/L, 96h static (Pimephales promelas) LC50: = 9850 mg/L, 96h flow-through (Pimephales promelas) LC50: > 10000 mg/L, 96h semi-static (Lepomis macrochirus) LC50: > 10000 mg/L, 96h static (Lepomis macrochirus)	EC50 = 733 mg/L 30 min	
Hydrogen chloride	Not listed	LC50: = 282 mg/L, 96h static (Gambusia affinis)	Not listed	Not listed

**Persistence and Degradability** Soluble in water Persistence is unlikely based on information available.

**Bioaccumulation/ Accumulation** No information available.

**Mobility** . Will likely be mobile in the environment due to its water solubility.

Component	log Pow
1,4-Dioxane	-0.42

### 13. Disposal considerations

**Waste Disposal Methods** Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

Component	RCRA - U Series Wastes	RCRA - P Series Wastes
1,4-Dioxane - 123-91-1	U108	-

### 14. Transport information

#### DOT

UN-No UN2924  
Proper Shipping Name Flammable liquid, corrosive, n.o.s.  
Hazard Class 3  
Subsidiary Hazard Class 8  
Packing Group II

#### TDG

UN-No UN2924  
Proper Shipping Name Flammable liquid, corrosive, n.o.s.  
Hazard Class 3  
Subsidiary Hazard Class 8  
Packing Group II

#### IATA

UN-No UN2924  
Proper Shipping Name FLAMMABLE LIQUID, CORROSIVE, N.O.S.\*  
Hazard Class 3  
Subsidiary Hazard Class 8  
Packing Group II

#### IMDG/IMO

UN-No UN2924  
Proper Shipping Name Flammable liquid, corrosive, n.o.s.  
Hazard Class 3  
Subsidiary Hazard Class 8  
Packing Group II

### 15. Regulatory information

#### United States of America Inventory

Component	CAS-No	TSCA	TSCA Inventory notification - Active/Inactive	TSCA - EPA Regulatory Flags
1,4-Dioxane	123-91-1	X	ACTIVE	-
Hydrogen chloride	7647-01-0	X	ACTIVE	-

**Legend:**

TSCA - Toxic Substances Control Act, (40 CFR Part 710)

X - Listed

- - Not Listed

TSCA 12(b) - Notices of Export Not applicable

**International Inventories**

Canada (DSL/NDSL), Europe (EINECS/ELINCS/NLP), Philippines (PICCS), Japan (ENCS), Australia (AICS), China (IECSC), Korea (ECL).

Component	CAS-No	DSL	NDSL	EINECS	PICCS	ENCS	AICS	IECSC	KECL
1,4-Dioxane	123-91-1	X	-	204-661-8	X	X	X	X	KE-10463
Hydrogen chloride	7647-01-0	X	-	231-595-7	X	X	X	X	KE-20189

**U.S. Federal Regulations****SARA 313**

Component	CAS-No	Weight %	SARA 313 - Threshold Values %
1,4-Dioxane	123-91-1	85	0.1
Hydrogen chloride	7647-01-0	15	1.0

SARA 311/312 Hazard Categories See section 2 for more information

**CWA (Clean Water Act)**

Component	CWA - Hazardous Substances	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants
Hydrogen chloride	X	5000 lb	-	-

**Clean Air Act**

Component	HAPS Data	Class 1 Ozone Depletors	Class 2 Ozone Depletors
1,4-Dioxane	X		-
Hydrogen chloride	X		-

OSHA - Occupational Safety and Health Administration

Component	Specifically Regulated Chemicals	Highly Hazardous Chemicals
Hydrogen chloride	-	TQ: 5000 lb

**CERCLA**

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Component	Hazardous Substances RQs	CERCLA EHS RQs
1,4-Dioxane	100 lb	-
Hydrogen chloride	5000 lb	5000 lb

**California Proposition 65**

This product contains the following Proposition 65 chemicals.

Component	CAS-No	California Prop. 65	Prop 65 NSRL	Category
1,4-Dioxane	123-91-1	Carcinogen	30 µg/day	Carcinogen

**U.S. State Right-to-Know Regulations**

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island



1,4-Dioxane	X	X	X	X	X
Hydrogen chloride	X	X	X	X	X

**U.S. Department of Transportation**

Reportable Quantity (RQ): N  
 DOT Marine Pollutant N  
 DOT Severe Marine Pollutant N

**U.S. Department of Homeland Security**

This product contains the following DHS chemicals:

**Legend** - STQs = Screening Threshold Quantities, APA = A placarded amount

Component	DHS Chemical Facility Anti-Terrorism Standard
Hydrogen chloride	Release STQs - 15000lb (concentration >=37%) Release STQs - 5000lb (anhydrous) Theft STQs - 500lb (anhydrous)

**Other International Regulations****Mexico - Grade** No information available

## 16. Other information

**Prepared By** Regulatory Affairs  
 Thermo Fisher Scientific  
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**Creation Date** 09-May-2012**Revision Date** 25-Apr-2019**Print Date** 25-Apr-2019

**Revision Summary** This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

**Disclaimer**

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

**End of SDS**