



ACETALDEHYDE-D4 (D, 99%)

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830 and according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of issue: 13/12/2010

Revision date: 13/11/2019

Supersedes: 16/07/2015

Version: 2.1

DLM-112

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form : Substance
Substance name : ACETALDEHYDE-D4 (D, 99%)
EC Index-No. : 605-003-00-6 (Unlabeled)
EC-No. : 200-836-8 (Unlabeled)
CAS-No. : 1632-89-9
Product code : DLM-112
Formula : CD3CDO
Synonyms : Ethanal, Tetradeuteroacetaldehyde

1.2. Relevant identified uses of the substance or mixture and uses advised against

1.2.1. Relevant identified uses

Main use category : Professional use
Industrial/Professional use spec : For professional use only

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Cambridge Isotope Laboratories, Inc.
50 Frontage Road
Andover, MA 01810
USA

USA: 1-800-322-1174 Int: 1-978-749-8000

cilsales@isotope.com www.isotope.com

Emergency telephone number

Emergency numbers:

Chemtrec: 1-800-424-9300 (24 hours)

International: 1-703-741-5970 (24 hours)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Flam. Liq. 1 H224
Acute Tox. 4 (Oral) H302
Eye Irrit. 2 H319
Carc. 2 H351
STOT SE 3 H335

Full text of hazard classes and H-statements : see section 16

Classification according to Directive 67/548/EEC [DSD] or 1999/45/EC [DPD]

F+; R12
Xi; R36/37
Carc.Cat.3; R40
R52

Full text of R-phrases: see section 16

GHS-US classification

Flam. Liq. 1 H224
Acute Tox. 4 (Oral) H302
Eye Irrit. 2A H319
Carc. 2 H351
STOT SE 3 H335
Aquatic Acute 3 H402

Full text of H statements : see section 16

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Adverse physicochemical, human health and environmental effects

Blood, Kidney, Lungs, Cardiovascular system, Liver, Central nervous system.

2.2. Label elements

Labeling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) :



Signal word (CLP) :

Danger

Hazard statements (CLP) :

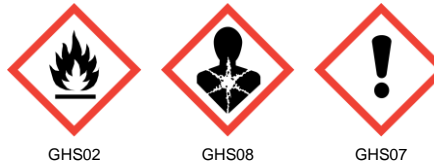
H224 - Extremely flammable liquid and vapour
H302 - Harmful if swallowed
H319 - Causes serious eye irritation
H335 - May cause respiratory irritation
H351 - Suspected of causing cancer (in contact with skin, if inhaled, if swallowed)

Precautionary statements (CLP) :

P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233 - Keep container tightly closed.
P240 - Ground/bond container and receiving equipment.
P241 - Use explosion-proof electrical, lighting, ventilating equipment
P261 - Avoid breathing dust, fume, gas, mist, spray, vapors.
P264 - Wash Both hands thoroughly after handling.
P270 - Do not eat, drink or smoke when using this product.
P271 - Use only outdoors or in a well-ventilated area.

GHS-US labeling

Hazard pictograms (GHS-US) :



Signal word (GHS-US) :

Danger

Hazard statements (GHS-US) :

H224 - Extremely flammable liquid and vapour
H302 - Harmful if swallowed
H319 - Causes serious eye irritation
H335 - May cause respiratory irritation
H351 - Suspected of causing cancer (Dermal, Inhalation, oral)
H402 - Harmful to aquatic life

Precautionary statements (GHS-US) :

P201 - Obtain special instructions before use.
P202 - Do not handle until all safety precautions have been read and understood.
P210 - Keep away from heat, hot surfaces, open flames, sparks. - No smoking.
P233 - Keep container tightly closed.
P240 - Ground/Bond container and receiving equipment
P241 - Use explosion-proof electrical, lighting, ventilating equipment
P242 - Use only non-sparking tools.
P243 - Take precautionary measures against static discharge.
P261 - Avoid breathing dust, fume, gas, mist, spray, vapors.
P264 - Wash Both hands thoroughly after handling.
P270 - Do not eat, drink or smoke when using this product.
P271 - Use only outdoors or in a well-ventilated area.
P273 - Avoid release to the environment.
P280 - Wear protective clothing, protective gloves.
P301+P312 - If swallowed: Call a poison center or doctor if you feel unwell
P303+P361+P353 - If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing
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.
P312 - Call a poison center or doctor if you feel unwell
P330 - Rinse mouth.
P337+P313 - If eye irritation persists: Get medical advice/attention.
P370+P378 - In case of fire: Use Alcohol resistant foam, Carbon dioxide, Dry chemical, Water

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spray to extinguish.
P403+P233 - Store in a well-ventilated place. Keep container tightly closed.
P403+P235 - Store in a well-ventilated place. Keep cool.
P405 - Store locked up.
P501 - Dispose of contents/container to Comply with applicable regulations

2.3. Other hazards

No additional information available

SECTION 3: Composition/Information on ingredients

3.1. Substances

Name	Product identifier	%	Classification according to Directive 67/548/EEC
ACETALDEHYDE-D4 (D, 99%)	(CAS-No.) 1632-89-9 (EC-No.) 200-836-8 (Unlabeled) (EC Index-No.) 605-003-00-6 (Unlabeled)	100	F+; R12 Xi; R36/37 Carc.Cat.3; R40 R52

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
ACETALDEHYDE-D4 (D, 99%)	(CAS-No.) 1632-89-9 (EC-No.) 200-836-8 (Unlabeled) (EC Index-No.) 605-003-00-6 (Unlabeled)	100	Flam. Liq. 1, H224 Acute Tox. 4 (Oral), H302 Eye Irrit. 2, H319 Carc. 2, H351 STOT SE 3, H335

Full text of R- and H- phrases: see section 16

Name	Product identifier	%	GHS-US classification
ACETALDEHYDE-D4 (D, 99%) (Main constituent)	(CAS-No.) 1632-89-9	100	Flam. Liq. 1, H224 Acute Tox. 4 (Oral), H302 Eye Irrit. 2A, H319 Carc. 2, H351 STOT SE 3, H335 Aquatic Acute 3, H402

Full text of H-phrases: see section 16

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general	: Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.
First-aid measures after inhalation	: If breathed in, move person to fresh air. If not breathing, give artificial respiration. Consult a physician.
First-aid measures after skin contact	: Wash with soap and plenty of water. Consult a physician.
First-aid measures after eye contact	: Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.
First-aid measures after ingestion	: Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/effects after inhalation	: May be harmful if inhaled. Causes respiratory tract irritation.
Symptoms/effects after skin contact	: May be harmful if absorbed through the skin. Causes skin irritation.
Symptoms/effects after eye contact	: Causes eye irritation.
Symptoms/effects after ingestion	: Harmful if swallowed.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	: For small fires, use media such as "alcohol" foam, dry chemical, or carbon dioxide. For large fires, apply water from as far as possible. Use very large quantities (flooding) of water applied as a mist or spray; solid streams of water may be ineffective. Cool all affected containers with flooding quantities of water.
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5.2. Special hazards arising from the substance or mixture

- Explosion hazard : May explode when heated. Closed containers may rupture and explode during runaway polymerization. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
- Reactivity : Vapors may form explosive mixture with air.

5.3. Advice for firefighters

- Firefighting instructions : Use water spray to cool unopened containers.
- Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

- General measures : Flammable in the presence of a source of ignition when the temperature is above the flash point. Keep away from heat/sparks/open flame/hot surface. No smoking.

6.1.1. For non-emergency personnel

- Emergency procedures : Use personal protective equipment, and ensure adequate ventilation. Avoid breathing vapors, mist, gas. Remove ignition sources, and move personnel to safe area. Vapors accumulate especially in low areas to form explosive concentrations.

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3. Methods and material for containment and cleaning up

- For containment : Contain spillage, then collect with non-combustible absorbent material. Disposal should be in accordance with applicable Federal, State and local regulations.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Additional hazards when processed : Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Use explosion-proof equipment. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.
- Hygiene measures : Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

7.2. Conditions for safe storage, including any incompatibilities

- Storage conditions : Store refrigerated (-5 °C to 5 °C). Protect from light.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

ACETALDEHYDE-D4 (D, 99%) (1632-89-9)		
USA OSHA	OSHA PEL (TWA) (ppm)	100 ppm
USA OSHA	OSHA PEL (STEL) (ppm)	150 ppm

8.2. Exposure controls

- Personal protective equipment : Gloves. Protective clothing. Protective goggles. Self-contained breathing apparatus.



- Eye protection : Wear safety glasses with side shields (or goggles) and a face shield.
- Skin and body protection : Choose body protection according to the amount and concentration of the dangerous substance at the work place. Handle with gloves.
- Respiratory protection : When appropriate, use NIOSH/CEN approved respirator.

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SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Appearance	: Liquid, clear
Molecular mass	: 48.08 g/mol (Labeled)
Color	: Colorless
Odor	: No data available
Odor threshold	: No data available
pH	: No data available
Relative evaporation rate (butyl acetate=1)	: No data available
Melting point	: -123 - -125 °C (-193 °F)
Freezing point	: No data available
Boiling point	: 21 °C (70 °F)
Flash point	: -38 °C (-40 °F) - closed cup.
Auto-ignition temperature	: 175 °C (347 °F)
Decomposition temperature	: No data available
Flammability (solid, gas)	: No data available
Vapor pressure	: 1008.5 hPa (756.4 mmHg) at 20 °C (68 °F)
Relative vapor density at 20 °C	: 1.52 - (Air = 1.0)
Relative density	: No data available
Specific gravity / density	: 0.79 g/cm ³
Solubility	: Water: Completely miscible
Log Pow	: 0.5
Log Kow	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidizing properties	: No data available
Explosion limits	: 4 - 57 % (V)

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

Vapors may form explosive mixture with air.

10.2. Chemical stability

Six months after receipt if stored as stated in "Storage" section. Re-QC after six months.

10.3. Possibility of hazardous reactions

No additional information available

10.4. Conditions to avoid

Air, heat, flames, sparks.

10.5. Incompatible materials

Oxidizing agents, Reducing agents, acids, Nitric acid, Peroxides, Bases. Sodium Hydroxide, Amins, Ammonia, Oxygen.

10.6. Hazardous decomposition products

Oxidized rapidly and exothermically by air, to acetic acid, Acid anhydrides, Alcohols, Halogens, Ketones, Phenol, Hydrogen cyanide (hydrocyanic acid). Formed under fire conditions: Carbon oxides.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Oral: Harmful if swallowed.

ACETALDEHYDE-D4 (D, 99%) (1632-89-9)	
LD50 oral rat	1930 mg/kg
LD50 dermal rabbit	3540 mg/kg
LC50 inhalation rat (ppm)	13300 ppm 4 h
ATE CLP (oral)	661.000 mg/kg body weight
ATE CLP (dermal)	3540.000 mg/kg body weight

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Effects of overexposure	Irritation. CNS effects. Intoxication. Respiratory paralysis. Possible mutagen. Possible teratogen.
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Skin corrosion/irritation	: Not classified Skin - Rabbit - Mild skin irritation.
Serious eye damage/irritation	: Causes serious eye irritation. Eyes - Rabbit - Severe eye irritation.
Respiratory or skin sensitization	: May cause allergic skin reaction.
Germ cell mutagenicity	: Laboratory experiments have shown mutagenic effects.
Carcinogenicity	: Limited evidence of a carcinogenic effect.
Reproductive toxicity	: Not classified
Specific target organ toxicity – single exposure	: May cause respiratory irritation. May cause damage to organs.
Specific target organ toxicity – repeated exposure	: Not classified
Aspiration hazard	: Not classified
IARC group	: 2B
Symptoms/effects after inhalation	: May be harmful if inhaled. Causes respiratory tract irritation.
Symptoms/effects after skin contact	: May be harmful if absorbed through the skin. Causes skin irritation.
Symptoms/effects after eye contact	: Causes eye irritation.
Symptoms/effects after ingestion	: Harmful if swallowed.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : Harmful to aquatic life.

ACETALDEHYDE-D4 (D, 99%) (1632-89-9)

LC50 fish 1	31 mg/l Pimephales promelas (fathead minnow) - 96 h
EC50 Daphnia 1	48 mg/l Daphnia magna (Water flea) - 48 h

12.2. Persistence and degradability

No additional information available

12.3. Bioaccumulative potential

ACETALDEHYDE-D4 (D, 99%) (1632-89-9)

Log Pow	0.5
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12.4. Mobility in soil

No additional information available

12.5. Results of PBT and vPvB assessment

No additional information available

12.6. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Regional legislation (waste) : Waste materials should be disposed of under conditions which meet Federal, State, and local environmental control regulations.

SECTION 14: Transport information

In accordance with ADR / RID / IMDG / IATA / ADN

14.1. UN number

UN-No.(DOT)	: 1089
DOT NA no.	UN1089

14.2. UN proper shipping name

Proper Shipping Name (DOT)	: Acetaldehyde
Class (DOT)	: 3 - Class 3 - Flammable and combustible liquid 49 CFR 173.120

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Hazard labels (DOT) : 3 - Flammable liquid



Packing group (DOT) : I - Great Danger

DOT Special Provisions (49 CFR 172.102) : A3 - For combination packaging, if glass inner packaging (including ampoules) are used, they must be packed with absorbent material in tightly closed metal receptacles before packing in outer packaging.
B16 - The lading must be completely covered with nitrogen, inert gas or other inert materials.
T11 - 6 178.274(d)(2) Normal..... 178.275(d)(3)
TP2 - a. The maximum degree of filling must not exceed the degree of filling determined by the following: (image) Where: tr is the maximum mean bulk temperature during transport, tf is the temperature in degrees celsius of the liquid during filling, and a is the mean coefficient of cubical expansion of the liquid between the mean temperature of the liquid during filling (tf) and the maximum mean bulk temperature during transportation (tr) both in degrees celsius. b. For liquids transported under ambient conditions may be calculated using the formula: (image) Where: d15 and d50 are the densities (in units of mass per unit volume) of the liquid at 15 C (59 F) and 50 C (122 F), respectively.
TP7 - The vapor space must be purged of air by nitrogen or other means.

DOT Packaging Exceptions (49 CFR 173.xxx) : None

DOT Packaging Non Bulk (49 CFR 173.xxx) : 201

DOT Packaging Bulk (49 CFR 173.xxx) : 243

DOT RQ : 1000 lbs.

Marine pollutant : No

14.3. Additional information

Other information : No supplementary information available.

Special transport precautions : IATA/DOT: Not permitted on passenger aircraft.

Overland transport

Packing group (ADR) : I

Class (ADR) : 3 - Flammable liquid

Hazard identification number (Kemler No.) : 33

Classification code (ADR) : F1

Hazard labels (ADR) : 3 - Flammable liquids



Orange plates : Two orange rectangular plates with black borders. The top plate contains the number "33" in black. The bottom plate contains the number "1089" in black.

Tunnel restriction code (ADR) : D/E

Limited quantities (ADR) : 0

EAC : •2YE

Excepted quantities (ADR) : E0

Transport by sea

DOT Vessel Stowage Location : E - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 m of overall vessel length, but is prohibited from carriage on passenger vessels in which the limiting number of passengers is exceeded.

MFAG-No : 129

Air transport

DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : Forbidden

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DOT Quantity Limitations Cargo aircraft only (49 : 30 L
CFR 175.75)
Civil Aeronautics Law : Flammable liquids

14.4. Environmental hazards

Other information : No supplementary information available.

14.5. Special precautions for user

Special transport precautions : IATA/DOT: Not permitted on passenger aircraft.

14.6. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

SECTION 15: Regulatory information

15.1. US Federal regulations

ACETALDEHYDE-D4 (D, 99%) (1632-89-9)	
SARA Section 302 Threshold Planning Quantity (TPQ)	Subject to reporting requirements of United States SARA Section 302
SARA Section 311/312 Hazard Classes	Fire hazard Immediate (acute) health hazard Delayed (chronic) health hazard
SARA Section 313 - Emission Reporting	Subject to reporting requirements of United States SARA Section 313

15.2. International regulations

CANADA

ACETALDEHYDE-D4 (D, 99%) (1632-89-9)
Listed on the Canadian DSL (Domestic Substances List)

15.2.1. National regulations

No additional information available

15.3. US State regulations

ACETALDEHYDE-D4 (D, 99%)(1632-89-9)	
U.S. - California - Proposition 65 - Carcinogens List	Yes
U.S. - California - Proposition 65 - Developmental Toxicity	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Female	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No
State or local regulations	U.S. - Massachusetts - Right To Know List U.S. - Pennsylvania - RTK (Right to Know) List U.S. - New Jersey - Right to Know Hazardous Substance List

SECTION 16: Other information

Full text of R-, H- and EUH-phrases:

Acute Tox. 4 (Oral)	Acute toxicity (oral) Category 4
Carc. 2	Carcinogenicity Category 2
Eye Irrit. 2	Serious eye damage/eye irritation Category 2
Flam. Liq. 1	Flammable liquids Category 1
STOT SE 3	Specific target organ toxicity (single exposure) Category 3
H224	Extremely flammable liquid and vapour
H302	Harmful if swallowed
H319	Causes serious eye irritation
H335	May cause respiratory irritation
H351	Suspected of causing cancer

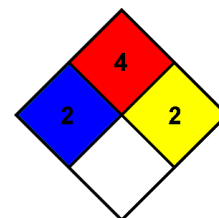
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R12	Extremely flammable
R36/37	Irritating to eyes and respiratory system
R40	Limited evidence of a carcinogenic effect
R52	Harmful to aquatic organisms
F+	Extremely flammable
Xi	Irritant

- NFPA health hazard : 2 - Materials that, under emergency conditions, can cause temporary incapacitation or residual injury.
- NFPA fire hazard : 4 - Materials that rapidly or completely vaporize at atmospheric pressure and normal ambient temperature or that are readily dispersed in air and burn readily.
- NFPA reactivity : 2 - Materials that readily undergo violent chemical change at elevated temperatures and pressures.



Hazard Rating

- Health : 2 Moderate Hazard - Temporary or minor injury may occur
- Flammability : 4 Severe Hazard
- Physical : 2 Moderate Hazard

CIL Substance SDS

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product