Tetrahydrofurfuryl Alcohol

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations
Issue date: 1/15/2024 Revision date: 1/15/2024 Supersedes: 9/1/2020 Version: 2.0

SECTION 1: Identification

1.1. Identification

Product form	:	Substance
Trade name	:	Tetrahydrofurfuryl Alcohol
CAS-No.	:	97-99-4
Formula	:	C5H10O2
Synonyms	:	2-Furanmethanol, tetrahydro- / Furfuryl alcohol, tetrahydro- / Tetrahydro-2-furanmethanol / Tetrahydro-2-furylmethanol / Tetrahydrofuran, 2-hydroxymethyl- / Furanmethanol, tetrahydro- / TETRAHYDROFURFURYL ALCOHOL / Tetrahydrofurfurol / Oxolan-2-ylmethanol / Tetrahydro-2-furyl-methanol / Tetrahydro-2-furanylmethanol

1.2. Recommended use and restrictions on use

Use of the substance/mixture	:	Solvent Chemical intermediate

1.3. Supplier

Monument Chemical
10200 Bay Area Blvd.
Pasadena, TX, 77507
USA
T (281)474-5550
sds@monumentchemical.com - www.monumentchemical.com

1.4. Emergency telephone number

Emergency number	:	24 HR CHEMTREC: 1-800-424-9300 (International +1 703-741-5970)

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS US classification

Flammable liquids Category 4	H227	Combustible liquid
Serious eye damage/eye irritation Category 2A	H319	Causes serious eye irritation
Reproductive toxicity Category 1B	H360	May damage fertility or the unborn child

Full text of H statements : see section 16

2.2. GHS Label elements, including precautionary statements

GHS US labeling

Hazard pictograms (GHS US) :

Signal word (GHS US)	:	Danger
Hazard statements (GHS US)	:	H227 - Combustible liquid H319 - Causes serious eye irritation H360 - May damage fertility or the unborn child
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, sparks, open flames and other ignition sources. No smoking.

P264 - Wash hands, forearms and face thoroughly after handling.
P280 - Wear protective gloves/protective clothing/eye protection/face protection.
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.
P337+P313 - If eye irritation persists: Get medical advice/attention.
P370+P378 - In case of fire: Use alcohol resistant foam, Water spray, carbon dioxide (CO2), dry extinguishing powder to extinguish.
P403+P235 - Store in a well-ventilated place. Keep cool.
P405 - Store locked up.
P501 - Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

2.3. Other hazards which do not result in classification

No additional information available

2.4. Unknown acute toxicity (GHS US)

No additional information available

SECTION 3: Composition/Information on ingredients

3.1. Substances

Name : Tetrahydrofurfuryl Alcohol
CAS-No. : 97-99-4

Name	Product identifier	%
tetrahydro-2-furylmethanol, tetrahydrofurfuryl alcohol	CAS-No.: 97-99-4	≥ 98
Pentane-1,2-diol	CAS-No.: 5343-92-0	≤ 2

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

3.2. Mixtures

Not applicable

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures general : Never give anything by mouth to an unconscious person. IF exposed or concerned: Get medical advice/attention.
First-aid measures after inhalation : Allow affected person to breathe fresh air. Allow the victim to rest.
First-aid measures after skin contact : Remove affected clothing and wash all exposed skin area with mild soap and water, followed by warm water rinse.
First-aid measures after eye contact : Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Consult an eye specialist. Get medical advice/attention.
First-aid measures after ingestion : Rinse mouth. Do NOT induce vomiting. Obtain emergency medical attention.

4.2. Most important symptoms and effects (acute and delayed)

Potential Adverse human health effects and symptoms : Based on available data, the classification criteria are not met.
Symptoms/effects after eye contact : Causes serious eye irritation.

4.3. Immediate medical attention and special treatment, if necessary

No additional information available

SECTION 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media

Suitable extinguishing media : Foam. Dry powder. Carbon dioxide. Water spray. Sand.
Unsuitable extinguishing media : Do not use a heavy water stream.

5.2. Specific hazards arising from the chemical

Fire hazard : Combustible liquid.
Explosion hazard : May form flammable/explosive vapor-air mixture.

5.3. Special protective equipment and precautions for fire-fighters

Firefighting instructions : Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Prevent fire-fighting water from entering environment.
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 : Remove ignition sources. Use special care to avoid static electric charges. No open flames. No smoking.

6.1.1. For non-emergency personnel

Emergency procedures : Evacuate unnecessary personnel.

6.1.2. For emergency responders

Protective equipment : Equip cleanup crew with proper protection.
Emergency procedures : Ventilate area.

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up : Soak up spills with inert solids, such as clay or diatomaceous earth as soon as possible. Collect spillage. Store away from other materials.

6.4. Reference to other sections

See Heading 8. Exposure controls and personal protection.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Additional hazards when processed : Handle empty containers with care because residual vapors are flammable. Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Precautions for safe handling : Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Provide good ventilation in process area to prevent formation of vapor. No open flames. No smoking. Do not handle until all safety precautions have been read and understood. Obtain special instructions before use.

Hygiene measures : Wash hands, forearms and face thoroughly after handling.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Proper grounding procedures to avoid static electricity should be followed.
Storage conditions : Keep only in the original container in a cool, well ventilated place away from : Heat sources, Ignition sources, Incompatible materials. Keep container closed when not in use. Keep in fireproof place.
Incompatible products : Strong bases. Strong acids.
Incompatible materials : Sources of ignition. Direct sunlight. Heat sources.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Tetrahydrofurfuryl Alcohol (97-99-4)	
USA - AIHA - Occupational Exposure Limits	
WEEL TWA [ppm]	0.5 ppm

tetrahydro-2-furylmethanol, tetrahydrofurfuryl alcohol (97-99-4)	
USA - AIHA - Occupational Exposure Limits	
WEEL TWA [ppm]	0.5 ppm
AIHA chemical category	skin notation

Pentane-1,2-diol (5343-92-0)
No additional information available

8.2. Appropriate engineering controls

No additional information available

8.3. Individual protection measures/Personal protective equipment

Personal protective equipment:
Avoid all unnecessary exposure.

Hand protection:
Wear protective gloves.

Eye protection:
Chemical goggles or safety glasses

Respiratory protection:
Wear appropriate mask

Personal protective equipment symbol(s):

Other information:
Do not eat, drink or smoke during use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Liquid
Appearance	:	Clear, colorless to pale yellow liquid.
Color	:	Light yellow to colourless
Odor	:	Mild odour characteristic
Odor threshold	:	No data available
pH	:	No data available
Melting point	:	No data available
Freezing point	:	-80 °C ; -112°F
Boiling point	:	178 °C ; 352°F
Flash point	:	75 °C (open cup)
Relative evaporation rate (butyl acetate=1)	:	No data available
Flammability (solid, gas)	:	No data available
Vapor pressure	:	0.8 mm Hg (at 25 °C)
Relative vapor density at 20°C	:	3.5
Relative density	:	1.05
Molecular mass	:	102.13 g/mol
Solubility	:	Soluble in water.
Partition coefficient n-octanol/water (Log Pow)	:	No data available
Auto-ignition temperature	:	282 °C ; 540°F
Decomposition temperature	:	No data available
Viscosity, kinematic	:	No data available
Viscosity, dynamic	:	No data available
Explosion limits	:	1.5 – 9.7 vol %
Explosive properties	:	No data available
Oxidizing properties	:	No data available

9.2. Other information

VOC content	:	100 %

SECTION 10: Stability and reactivity

10.1. Reactivity

No additional information available

10.2. Chemical stability

Combustible liquid. May form flammable/explosive vapor-air mixture.

10.3. Possibility of hazardous reactions

Not established.

10.4. Conditions to avoid

Direct sunlight. Extremely high or low temperatures. Open flame. Overheating. Heat. Sparks.

10.5. Incompatible materials

Strong acids. Strong bases.

10.6. Hazardous decomposition products

fume. Carbon monoxide. Carbon dioxide. May release flammable gases.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral) : Not classified
Acute toxicity (dermal) : Not classified
Acute toxicity (inhalation) : Not classified

tetrahydro-2-furylmethanol, tetrahydrofurfuryl alcohol (97-99-4)	
LD50 oral rat	> 2000 mg/kg (Equivalent or similar to OECD 423, Rat, Female, Experimental value, Oral, 15 day(s))
LD50 dermal rabbit	5 g/kg (Guinea Pig)
LC50 Inhalation - Rat	> 3.1 mg/l (OECD 403: Acute Inhalation Toxicity, 4 h, Rat, Male / female, Experimental value, Inhalation (vapours), 14 day(s))
ATE US (dermal)	5000 mg/kg body weight

Pentane-1,2-diol (5343-92-0)	
LD50 oral rat	12700 mg/kg
LD50 dermal rat	> 2000 mg/kg body weight Animal: rat, Guideline: OECD Guideline 402 (Acute Dermal Toxicity)
LD50 dermal rabbit	> 2000 mg/kg body weight (OECD 402: Acute Dermal Toxicity, 24 h, Rabbit, Male / female, Experimental value, Dermal)
LC50 Inhalation - Rat	> 7015 mg/m³ air (Equivalent or similar to OECD 403, 4 h, Rat, Male / female, Experimental value, Inhalation (aerosol))
ATE US (oral)	12700 mg/kg body weight

Skin corrosion/irritation : Not classified

tetrahydro-2-furylmethanol, tetrahydrofurfuryl alcohol (97-99-4)	
pH	5 – 6 (25 %)

Pentane-1,2-diol (5343-92-0)	
pH	7 – 8 (50 %, 20 °C)

Serious eye damage/irritation : Causes serious eye irritation.

tetrahydro-2-furylmethanol, tetrahydrofurfuryl alcohol (97-99-4)	
pH	5 – 6 (25 %)

Pentane-1,2-diol (5343-92-0)	
pH	7 – 8 (50 %, 20 °C)

Respiratory or skin sensitization : Not classified
Germ cell mutagenicity : Not classified
Carcinogenicity : Not classified
Reproductive toxicity : May damage fertility or the unborn child.

tetrahydro-2-furylmethanol, tetrahydrofurfuryl alcohol (97-99-4)	
NOAEL (animal/male, F0/P)	150 mg/kg body weight Animal: rat, Animal sex: male, Guideline: OECD Guideline 422 (Combined Repeated Dose Toxicity Study with the Reproduction / Developmental Toxicity Screening Test)
NOAEL (animal/female, F0/P)	50 mg/kg body weight Animal: rat, Animal sex: female, Guideline: OECD Guideline 422 (Combined Repeated Dose Toxicity Study with the Reproduction / Developmental Toxicity Screening Test)

STOT-single exposure : Not classified

STOT-repeated exposure : Not classified

Pentane-1,2-diol (5343-92-0)	
NOAEL (oral,rat,90 days)	1000 mg/kg body weight Animal: rat, Guideline: OECD Guideline 408 (Repeated Dose 90-Day Oral Toxicity in Rodents)

Aspiration hazard : Not classified
Viscosity, kinematic : No data available

tetrahydro-2-furylmethanol, tetrahydrofurfuryl alcohol (97-99-4)	
Viscosity, kinematic	5.932 mm²/s

Pentane-1,2-diol (5343-92-0)	
Viscosity, kinematic	79.4 mm²/s (20 °C)

Potential Adverse human health effects and symptoms : Based on available data, the classification criteria are not met.
Symptoms/effects after eye contact : Causes serious eye irritation.

SECTION 12: Ecological information

12.1. Toxicity

tetrahydro-2-furylmethanol, tetrahydrofurfuryl alcohol (97-99-4)	
LC50 - Fish [1]	> 101 mg/l (Exposure time: 96 h - Species: Oryzias latipes [semi-static])
EC50 - Crustacea [1]	> 91.7 mg/l (OECD 202: Daphnia sp. Acute Immobilisation Test, 48 h, Daphnia magna, Semi-static system, Fresh water, Experimental value, Locomotor effect)
EC50 72h - Algae [1]	> 98.9 mg/l Test organisms (species): Pseudokirchneriella subcapitata (previous names: Raphidocelis subcapitata, Selenastrum capricornutum)
ErC50 algae	> 98.9 mg/l (OECD 201: Alga, Growth Inhibition Test, 72 h, Pseudokirchneriella subcapitata, Static system, Experimental value, GLP)
LOEC (chronic)	> 95.1 mg/l Test organisms (species): Daphnia magna Duration: '21 d'
NOEC (chronic)	≥ 95.1 mg/l Test organisms (species): Daphnia magna Duration: '21 d'

Pentane-1,2-diol (5343-92-0)	
LC50 - Fish [1]	> 1096 mg/l (Exposure time: 96 h - Species: Danio rerio [static])
EC50 - Crustacea [1]	> 500 mg/l (EU Method, 48 h, Daphnia magna, Static system, Fresh water, Experimental value)
LC50 - Fish [2]	> 1096 mg/l (OECD 203: Fish, Acute Toxicity Test, 96 h, Danio rerio, Static system, Fresh water, Experimental value, GLP)
EC50 72h - Algae [1]	9334.69 mg/l (DIN 38412: German standard methods for the examination of water, waste water and sludge, Desmodesmus subspicatus, Static system, Fresh water, Experimental value, Growth rate)
EC50 72h - Algae [2]	6944.99 mg/l (DIN 38412: German standard methods for the examination of water, waste water and sludge, Desmodesmus subspicatus, Static system, Fresh water, Experimental value, Biomass)

12.2. Persistence and degradability

tetrahydro-2-furylmethanol, tetrahydrofurfuryl alcohol (97-99-4)	
Persistence and degradability	Readily biodegradable in water.
Chemical oxygen demand (COD)	0.04 g O_2/g substance

tetrahydro-2-furylmethanol, tetrahydrofurfuryl alcohol (97-99-4)	
ThOD	2.04 g O_2/g substance

Pentane-1,2-diol (5343-92-0)	
Persistence and degradability	Readily biodegradable in water.

12.3. Bioaccumulative potential

tetrahydro-2-furylmethanol, tetrahydrofurfuryl alcohol (97-99-4)	
Partition coefficient n-octanol/water (Log Pow)	-0.14 (Experimental value, OECD 107: Partition Coefficient (n-octanol/water): Shake Flask Method, 24.7 °C)
Bioaccumulative potential	Not bioaccumulative.

Pentane-1,2-diol (5343-92-0)	
Partition coefficient n-octanol/water (Log Pow)	0.2
Bioaccumulative potential	Low potential for bioaccumulation (Log Kow < 4).

12.4. Mobility in soil

tetrahydro-2-furylmethanol, tetrahydrofurfuryl alcohol (97-99-4)	
Surface tension	37 mN/m (25 °C)
Organic Carbon Normalized Adsorption Coefficient (Log Koc)	0.199 – 0.362 (log Koc, SRC PCKOCWIN v2.0, Calculated value)
Ecology - soil	Highly mobile in soil.

Pentane-1,2-diol (5343-92-0)	
Organic Carbon Normalized Adsorption Coefficient (Log Koc)	0 (log Koc, PCKOCWIN v1.66, Calculated value)
Ecology - soil	Highly mobile in soil.

12.5. Other adverse effects

Other information : Avoid release to the environment.

SECTION 13: Disposal considerations

13.1. Disposal methods

Product/Packaging disposal recommendations : Dispose in a safe manner in accordance with local/national regulations. Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

Additional information : Handle empty containers with care because residual vapors are flammable.

Ecology - waste materials : Avoid release to the environment.

SECTION 14: Transport information

In accordance with DOT / IMDG / IATA

14.1. UN number

DOT NA No : NA1993

UN-No. (IMDG) : Not regulated

UN-No. (IATA) : Not regulated

14.2. UN proper shipping name

Proper Shipping Name (DOT) : Combustible liquid, n.o.s. (Tetrahydrofurfuryl alcohol)
Proper Shipping Name (IMDG) : Not regulated
Proper Shipping Name (IATA) : Not regulated
Transport document description (DOT) : NA1993 Combustible liquid, n.o.s. (Tetrahydrofurfuryl alcohol), 3, III

14.3. Transport hazard class(es)

DOT
Transport hazard class(es) (DOT) : Combustible liquid

IMDG
Transport hazard class(es) (IMDG) : Not regulated

IATA
Transport hazard class(es) (IATA) : Not regulated

14.4. Packing group

Packing group (DOT) : III
Packing group (IMDG) : Not regulated
Packing group (IATA) : Not regulated

14.5. Environmental hazards

Other information : Transportation Notes: Material is not regulated by the U.S. DOT for ground transportation within the U.S. if shipped in non-bulk packaging (<119 gallons).

14.6. Special precautions for user

DOT
UN-No.(DOT) : NA1993
DOT Special Provisions (49 CFR 172.102) : IB3 - Authorized IBCs: Metal (31A, 31B and 31N); Rigid plastics (31H1 and 31H2); Composite (31HZ1 and 31HA2, 31HB2, 31HN2, 31HD2 and 31HH2). Additional Requirement: Only liquids with a vapor pressure less than or equal to 110 kPa at 50 C (1.1 bar at 122 F), or 130 kPa at 55 C (1.3 bar at 131 F) are authorized, except for UN2672 (also see Special Provision IP8 in Table 2 for UN2672).
T1 - 1.5 178.274(d)(2) Normal..... 178.275(d)(2)
T4 - 2.65 178.274(d)(2) Normal..... 178.275(d)(3)
TP1 - The maximum degree of filling must not exceed the degree of filling determined by the following: Degree of filling = 97 / 1 + a (tr - tf) Where: tr is the maximum mean bulk temperature during transport, and tf is the temperature in degrees celsius of the liquid during filling.
DOT Packaging Exceptions (49 CFR 173.xxx) : 150
DOT Packaging Non Bulk (49 CFR 173.xxx) : 203
DOT Packaging Bulk (49 CFR 173.xxx) : 241
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : 60 L
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 220 L
DOT Vessel Stowage Location : A - The material may be stowed ‘‘on deck’’ or ‘‘under deck’’ on a cargo vessel and on a passenger vessel.

IMDG
Not regulated

IATA
Not regulated

14.7. 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

All components of this product are present and listed as Active on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory

This product or mixture is not known to contain a toxic chemical or chemicals in excess of the applicable de minimis concentration as specified in 40 CFR §372.38(a) subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

15.2. International regulations

CANADA

Tetrahydrofurfuryl Alcohol (97-99-4)

Listed on the Canadian DSL (Domestic Substances List)

Pentane-1,2-diol (5343-92-0)

Listed on the Canadian NDSL (Non-Domestic Substances List)

EU-Regulations

Tetrahydrofurfuryl Alcohol (97-99-4)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

Pentane-1,2-diol (5343-92-0)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

National regulations

Tetrahydrofurfuryl Alcohol (97-99-4)

Listed introduction on Australian Industrial Chemicals Introduction Scheme (AICIS Inventory)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on the Japanese ENCS (Existing New Chemical Substances) inventory
Listed on KECL/KECI (Korean Existing Chemicals Inventory)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on the Japanese ISHL (Industrial Safety and Health Law)
Listed on the TCSI (Taiwan Chemical Substance Inventory)
Listed on the NCI (Vietnam - National Chemical Inventory)

Pentane-1,2-diol (5343-92-0)

Listed introduction on Australian Industrial Chemicals Introduction Scheme (AICIS Inventory)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on the Japanese ENCS (Existing New Chemical Substances) inventory
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on KECL/KECI (Korean Existing Chemicals Inventory)
Listed on the Japanese ISHL (Industrial Safety and Health Law)
Listed on INSQ (Mexican National Inventory of Chemical Substances)
Listed on the TCSI (Taiwan Chemical Substance Inventory)
Listed on the NCI (Vietnam - National Chemical Inventory)

15.3. US State regulations

Tetrahydrofurfuryl Alcohol (97-99-4)	
State or local regulations	U.S. - Pennsylvania - RTK (Right to Know) List U.S. - Massachusetts - Right To Know List

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

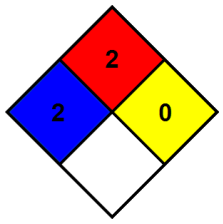
Component	State or local regulations
tetrahydro-2-furylmethanol, tetrahydrofurfuryl alcohol(97-99-4)	U.S. - Pennsylvania - RTK (Right to Know) List; U.S. - Massachusetts - Right To Know List

SECTION 16: Other information

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations
Revision date : 1/15/2024
Other information : None.

Full text of H-phrases	
H227	Combustible liquid
H319	Causes serious eye irritation
H360	May damage fertility or the unborn child

NFPA health hazard : 2 - Materials that, under emergency conditions, can cause temporary incapacitation or residual injury.
NFPA fire hazard : 2 - Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur.
NFPA reactivity : 0 - Material that in themselves are normally stable, even under fire conditions.



Hazard Rating
Health : 2 Moderate Hazard - Temporary or minor injury may occur
Flammability : 2 Moderate Hazard - Materials which must be moderately heated or exposed to high ambient temperatures before ignition will occur. Includes liquids having a flash point at or above 100 F but below 200 F. (Classes II IIIA)
Physical : 0 Minimal Hazard - Materials that are normally stable, even under fire conditions, and will NOT react with water, polymerize, decompose, condense, or self-react. Non-Explosives.
Personal protection : C - Safety glasses, Gloves, Synthetic apron

Safety Data Sheet (SDS), USA