1 Identification

Product identifier

Product name: Furfuryl alcohol

Stock number: A10968
CAS Number:
98-00-0
EC number:
202-626-1
Index number:
603-018-00-2
Relevant identified uses of the substance or mixture and uses advised against.
Identified use: SU24 Scientific research and development

Details of the supplier of the safety data sheet
Manufacturer/Supplier:
Alfa Aesar
Thermo Fisher Scientific Chemicals, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Tel: 800-343-0660
Fax: 800-322-4757
Email: tech@alfa.com
www.alfa.com
Information Department: Health, Safety and Environmental Department
Emergency telephone number:
During normal business hours (Monday-Friday, 8am-7pm EST), call (800) 343-0660. After normal business hours, call Carechem 24 at (866) 928-0789.

2 Hazard(s) identification

Classification of the substance or mixture in accordance with 29 CFR 1910 (OSHA HCS)


GHS06 Skull and crossbones

Acute Tox. 3 H331 Toxic if inhaled.


GHS08 Health hazard

Carc. 2 H351 Suspected of causing cancer.
STOT RE 2 H373 May cause damage to the brain and the olfactory system through prolonged or repeated exposure. Route of exposure: Inhalation.


GHS07

Acute Tox. 4 H302 Harmful if swallowed.
Acute Tox. 4 H312 Harmful in contact with skin.
Eye Irrit. 2A H319 Causes serious eye irritation.
STOT SE 3 H335 May cause respiratory irritation.

Flam. Liq. 4 H227 Combustible liquid.
Hazards not otherwise classified No information known.

Label elements
GHS label elements The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS)
Hazard pictograms


GHS06 GHS08

Signal word Danger
Hazard statements
H227 Combustible liquid.
H302+H312 Harmful if swallowed or in contact with skin.
H331 Toxic if inhaled.
H319 Causes serious eye irritation.
H351 Suspected of causing cancer.
H335 May cause respiratory irritation.
H373 May cause damage to the brain and the olfactory system through prolonged or repeated exposure. Route of exposure: Inhalation.
Precautionary statements
P210 Keep away from flames and hot surfaces. No smoking.
P260 Do not breathe dust/fume/gas/mist/vapors/spray.
P201 Obtain special instructions before use.
P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.
WHMIS classification
B3 - Combustible liquid
D1A - Very toxic material causing immediate and serious toxic effects
D2A - Very toxic material causing other toxic effects

(Contd. on page 2)

Product name: Furfuryl alcohol

(Contd. of page 1)

Classification system
HMIS ratings (scale 0-4)
(Hazardous Materials Identification System)

HEALTH 2 — Health (acute effects) = 2
FIRE 2 — Flammability = 2
REACTIVITY 1 — Physical Hazard = 1

Other hazards
Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.

3 Composition/information on ingredients

Chemical characterization: Substances
CAS# Description:
98-00-0 Furfuryl alcohol
Concentration: ≤100%
Identification number(s):
EC number: 202-626-1
Index number: 603-018-00-2

4 First-aid measures

Description of first aid measures
General information
Immediately remove any clothing soiled by the product.
Remove breathing apparatus only after contaminated clothing has been completely removed.
In case of irregular breathing or respiratory arrest provide artificial respiration.
After inhalation
Supply fresh air. If required, provide artificial respiration. Keep patient warm.
Seek immediate medical advice.
After skin contact
Immediately wash with water and soap and rinse thoroughly.
Seek immediate medical advice.
After eye contact Rinse opened eye for several minutes under running water. Then consult a doctor.
After swallowing Seek medical treatment.
Information for doctor
Most important symptoms and effects, both acute and delayed
Harmful if swallowed.
Causes serious eye irritation.
Harmful in contact with skin.
Toxic if inhaled.
Suspected of causing cancer.
May cause damage to the brain and the olfactory system through prolonged or repeated exposure. Route of exposure: Inhalation.
Indication of any immediate medical attention and special treatment needed No further relevant information available.

5 Fire-fighting measures

Extinguishing media
Suitable extinguishing agents Use carbon dioxide, extinguishing powder or foam. Water may be ineffective but may be used for cooling exposed containers.
Special hazards arising from the substance or mixture
If this product is involved in a fire, the following can be released:
Carbon monoxide and carbon dioxide
Advice for firefighters
Protective equipment:
Wear self-contained respirator.
Wear fully protective impervious suit.

6 Accidental release measures

Personal precautions, protective equipment and emergency procedures
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation
Environmental precautions: Do not allow product to reach sewage system or any water course.
Methods and material for containment and cleaning up:
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose of contaminated material as waste according to section 13.
Ensure adequate ventilation.
Prevention of secondary hazards: Keep away from ignition sources.
Reference to other sections
See Section 7 for information on safe handling
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.
Protective Action Criteria for Chemicals
PAC-1: 15 ppm
PAC-2: 42 ppm
PAC-3: 250 ppm

7 Handling and storage

Handling
Precautions for safe handling
Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.
Ensure good ventilation at the workplace.
Open and handle container with care.
Information about protection against explosions and fires: Keep ignition sources away.

Conditions for safe storage, including any incompatibilities
Storage
Requirements to be met by storerooms and receptacles: No special requirements.
Information about storage in one common storage facility:
Do not store together with acids.

(Contd. on page 3)

Product name: Furfuryl alcohol

(Contd. of page 2)

Store away from oxidizing agents.
Store away from acid chlorides.
Store away from acid anhydrides.
Further information about storage conditions:
Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.
Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Control parameters

Components with limit values that require monitoring at the workplace:

98-00-0 Furfuryl alcohol (100.0%)

PEL (USA)	Long-term value: 200 mg/m³, 50 ppm
REL (USA)	Short-term value: 60 mg/m³, 15 ppm Long-term value: 40 mg/m³, 10 ppm Skin
TLV (USA)	Short-term value: (60) mg/m³, (15) ppm Long-term value: (40) NIC-0.8 mg/m³, (10) NIC-0.2 ppm NIC-A3; Skin
EL (Canada)	Short-term value: 10 ppm Long-term value: 5 ppm Skin
EV (Canada)	Short-term value: 60 mg/m³, 15 ppm Long-term value: 40 mg/m³, 10 ppm Skin

Additional information: No data

Exposure controls
Personal protective equipment
General protective and hygienic measures
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
Avoid contact with the eyes.
Avoid contact with the eyes and skin.
Maintain an ergonomically appropriate working environment.
Breathing equipment: Use self-contained respiratory protective device in emergency situations.
Recommended filter device for short term use:
Use a respirator with multi-purpose combination (US) or type ABEK (EN 14387) as a backup to engineering controls. Risk assessment should be performed to determine if air-purifying respirators are appropriate. Only use equipment tested and approved under appropriate government standards such as NIOSH (USA) or CEN (EU).
Protection of hands:
Impervious gloves
Check protective gloves prior to each use for their proper condition.
The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.
Material of gloves Butyl rubber, BR
Penetration time of glove material (in minutes) 480

Glove thickness: 0.3 mm
Eye protection: Safety glasses with side shields / NIOSH (US) or EN 166(EU)
Body protection: Protective work clothing.

9 Physical and chemical properties

Information on basic physical and chemical properties
General Information

Appearance:	
Form:	Liquid
Odor:	Mild
Odor threshold:	Not determined.
pH-value:	Not determined.
Change in condition	
Melting point/Melting range:	-31 °C (-24 °F)
Boiling point/Boiling range:	170-171 °C (338-340 °F)
Sublimation temperature / start:	Not determined
Flash point:	65 °C (149 °F)
Flammability (solid, gaseous)	Not determined.
Ignition temperature:	390 °C (734 °F)
Decomposition temperature:	Not determined
Auto igniting:	Not determined.
Danger of explosion:	Not determined.
Explosion limits:	
Lower:	1.8 Vol %
Upper:	16.3 Vol %
Vapor pressure at 20 °C (68 °F):	0.53 hPa
Density at 20 °C (68 °F):	1.129 g/cm³ (9.422 lbs/gal)
Relative density	Not determined.
Vapor density	Not determined.
Evaporation rate	Not determined.
Solubility in / Miscibility with	
Water:	Fully miscible
Partition coefficient (n-octanol/water):	Not determined.
Viscosity:	
dynamic:	Not determined.

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Product name: Furfuryl alcohol

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kinematic:	Not determined.
Other information	No further relevant information available.

10 Stability and reactivity

Reactivity No information known.
Chemical stability Stable under recommended storage conditions.
Thermal decomposition / conditions to be avoided: Decomposition will not occur if used and stored according to specifications.
Possibility of hazardous reactions Reacts with strong oxidizing agents
Conditions to avoid No further relevant information available.
Incompatible materials:
Acids
Oxidizing agents
Acid chlorides
Acid anhydrides
Hazardous decomposition products: Carbon monoxide and carbon dioxide

11 Toxicological information

Information on toxicological effects
Acute toxicity:
Harmful in contact with skin.
Harmful if swallowed.
Toxic if inhaled.
Danger through skin absorption.
The Registry of Toxic Effects of Chemical Substances (RTECS) contains acute toxicity data for this substance.

LD/LC50 values that are relevant for classification:

Oral	LD50	177 mg/kg (rat)
Dermal	LD50	400 mg/kg (rabbit)
Inhalative	LC50/4H	952 mg/m3/4H (rat)

Skin irritation or corrosion: May cause irritation
Eye irritation or corrosion: Causes serious eye irritation.
Sensitization: No sensitizing effects known.
Germ cell mutagenicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains mutation data for this substance.
Carcinogenicity:
Suspected of causing cancer.
The Registry of Toxic Effects of Chemical Substances (RTECS) contains tumorigenic and/or carcinogenic and/or neoplastic data for this substance.
Reproductive toxicity: No effects known.
Specific target organ system toxicity - repeated exposure:
May cause damage to the brain and the olfactory system through prolonged or repeated exposure. Route of exposure: Inhalation.
Specific target organ system toxicity - single exposure: May cause respiratory irritation.
Aspiration hazard: No effects known.
Subacute to chronic toxicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains multiple dose toxicity data for this substance.
Additional toxicological information: To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

12 Ecological information

Toxicity
Aquatic toxicity: No further relevant information available.
Persistence and degradability No further relevant information available.
Bioaccumulative potential No further relevant information available.
Mobility in soil No further relevant information available.
Additional ecological information:
General notes:
Do not allow undiluted product or large quantities to reach ground water, water course or sewage system.
Avoid transfer into the environment.
Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.
Other adverse effects No further relevant information available.

13 Disposal considerations

Waste treatment methods
Recommendation Consult state, local or national regulations to ensure proper disposal.
Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.
Recommended cleansing agent: Water, if necessary with cleansing agents.

14 Transport information

UN-Number **DOT, IMDG, IATA**	UN2874
UN proper shipping name **DOT** **ADR** **IMDG, IATA**	Furfuryl alcohol 2874 Furfuryl alcohol FURFURYL ALCOHOL
Transport hazard class(es)	
DOT	
Class	6.1 Toxic substances

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Product name: Furfuryl alcohol

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Label	6.1
ADR	
	
Class	6.1 (T1) Toxic substances
Label	6.1
IMDG, IATA	
	
Class	6.1 Toxic substances
Label	6.1
Packing group	
DOT, ADR, IMDG, IATA	III
Environmental hazards:	Not applicable.
Special precautions for user	Warning: Toxic substances
EMS Number:	F-A,S-A
Stowage Category	A
Segregation Code	SG17 Stow "separated from" class 5.1 SG35 Stow "separated from" acids.
Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	Not applicable.
Transport/Additional information:	
DOT	
Quantity limitations	On passenger aircraft/rail: 60 L On cargo aircraft only: 220 L
Marine Pollutant (DOT):	No
IMDG	
Limited quantities (LQ)	5L
Excepted quantities (EQ)	Code: E1 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml
UN "Model Regulation":	UN 2874 FURFURYL ALCOHOL, 6.1, III

15 Regulatory information

Safety, health and environmental regulations/legislation specific for the substance or mixture
GHS label elements The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS)
Hazard pictograms

GHS06 GHS08

Signal word Danger
Hazard statements
H227 Combustible liquid.
H302+H312 Harmful if swallowed or in contact with skin.
H331 Toxic if inhaled.
H319 Causes serious eye irritation.
H351 Suspected of causing cancer.
H335 May cause respiratory irritation.
H373 May cause damage to the brain and the olfactory system through prolonged or repeated exposure. Route of exposure: Inhalation.
Precautionary statements
P210 Keep away from flames and hot surfaces. No smoking.
P260 Do not breathe dust/fume/gas/mist/vapors/spray.
P201 Obtain special instructions before use.
P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.
National regulations
All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.
All components of this product are listed on the Canadian Domestic Substances List (DSL).
SARA Section 313 (specific toxic chemical listings) Substance is not listed.
California Proposition 65

Prop 65 - Chemicals known to cause cancer
98-00-0 Furfuryl alcohol

Prop 65 - Developmental toxicity Substance is not listed.
Prop 65 - Developmental toxicity, female Substance is not listed.
Prop 65 - Developmental toxicity, male Substance is not listed.
Information about limitation of use: For use only by technically qualified individuals.
Other regulations, limitations and prohibitive regulations
Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006. Substance is not listed.
The conditions of restrictions according to Article 67 and Annex XVII of the Regulation (EC) No 1907/2006 (REACH) for the manufacturing, placing on the market and use must be observed.
Substance is not listed.
Annex XIV of the REACH Regulations (requiring Authorisation for use) Substance is not listed.
Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Department issuing SDS: Global Marketing Department

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Product name: Furfuryl alcohol

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Date of preparation/Revision: Print date, revision date and version number are in the header of each page.
Abbreviations and acronyms:
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
HMIS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
SVHC: Substances of Very High Concern
vPvB: very Persistent and very Bioaccumulative
ACGIH: American Conference of Governmental Industrial Hygienists (USA)
OSHA: Occupational Safety and Health Administration (USA)
NTP: National Toxicology Program (USA)
IARC: International Agency for Research on Cancer
EPA: Environmental Protection Agency (USA)
Flam. Liq. 4: Flammable liquids – Category 4
Acute Tox. 4: Acute toxicity – Category 4
Acute Tox. 3: Acute toxicity – Category 3
Eye Irrit. 2A: Serious eye damage/eye irritation – Category 2A
Carc. 2: Carcinogenicity – Category 2
STOT SE 3: Specific target organ toxicity (single exposure) – Category 3
STOT RE 2: Specific target organ toxicity (repeated exposure) – Category 2