

Material Safety Data Sheet

According to OSHA and ANSI

Printing date 06/01/2011

Reviewed on 01/27/2010

1 Identification of the substance/mixture and of the company/undertaking**Product identifier****Product name:** Furfuryl alcohol**Stock number:** A10968**CAS Number:**

98-00-0

EINECS Number:

202-626-1

Index number:

603-018-00-2

Relevant identified uses of the substance or mixture and uses advised against.**Sector of Use** SU24 Scientific research and development**Details of the supplier of the safety data sheet****Manufacturer/Supplier:**

Alfa Aesar, A Johnson Matthey Company

Johnson Matthey Catalog Company, 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 hours the Health, Safety and Environmental Department at (800) 343-0660. After normal hours call Carechem 24 at (866) 928-0789.

2 Hazards identification**Classification of the substance or mixture**

GHS06 Skull and crossbones

H301 Toxic if swallowed.

H311 Toxic in contact with skin.

H330 Fatal if inhaled.



GHS08 Health hazard

H351 Suspected of causing cancer.

H373 May cause damage to organs through prolonged or repeated exposure.



GHS07

H319 Causes serious eye irritation.

H335 May cause respiratory irritation.

H227 Combustible liquid.

Classification according to Directive 67/548/EEC or Directive 1999/45/EC

T; Toxic

R23: Toxic by inhalation.



Xn; Harmful

R21/22-40-48/20: Harmful in contact with skin and if swallowed. Limited evidence of a carcinogenic effect. Harmful; danger of serious damage to health by prolonged exposure through inhalation.



Xi; Irritant

R36/37: Irritating to eyes and respiratory system.

Label elements**Labelling according to EU guidelines:****Code letter and hazard designation of product:**

T Toxic

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Risk phrases:

21/22 Harmful in contact with skin and if swallowed.
 23 Toxic by inhalation.
 36/37 Irritating to eyes and respiratory system.
 40 Limited evidence of a carcinogenic effect.
 48/20 Harmful: danger of serious damage to health by prolonged exposure through inhalation.

Safety phrases:

36/37 Wear suitable protective clothing and gloves.
 45 In case of accident or if you feel unwell, seek medical advice immediately.
 63 In case of accident by inhalation: remove casualty to fresh air and keep at rest

Hazard description:**WHMIS classification****Classification system****HMIS ratings (scale 0-4)**

(Hazardous Materials Identification System)

HEALTH	*3
FIRE	2
REACTIVITY	1

Health (acute effects) = *3
 Flammability = 2
 Reactivity = 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:**

Furfuryl alcohol (CAS# 98-00-0)

Identification number(s):

EINECS Number: 202-626-1

Index number: 603-018-00-2

4 First aid measures**Description of first aid measures****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 immediate medical advice.

5 Firefighting measures**Extinguishing media****Suitable extinguishing agents**

Carbon dioxide, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

Special hazards arising from the substance or mixture

In case of 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.

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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 material to be released to the environment without proper governmental permits.

Methods and material for containment and cleaning up:

Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

Dispose contaminated material as waste according to item 13.

Ensure adequate ventilation.

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.

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.

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:** Store away from oxidizing agents.**Further information about storage conditions:**

Keep container tightly sealed.

Store in cool, dry conditions in well sealed containers.

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.

Components with limit values that require monitoring at the workplace:

Furfuryl alcohol

	ppm
ACGIH TLV	10, 15-STEEL (skin)
Austria MAK	5
Belgium TWA	10, 15-STEEL (skin)
Denmark TWA	5 (skin)
Finland TWA	5, 10-STEEL (skin)
France VME	10 (skin)
Germany MAK	10
Hungary	8 mg/m3-STEEL (skin)
Netherlands MAC-TGG	20 mg/m3 (skin)
Norway TWA	5
Russia TWA	5, 0.5 mg/m3-STEEL (skin)
Sweden NGV	5, 10-KTV
Switzerland MAK-W	10 (skin)
United Kingdom TWA	5, 15-STEEL (skin)
USA PEL	50

Control parameters**Components with limit values that require monitoring at the workplace:****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.

Avoid contact with the eyes and skin.

Breathing equipment: Use suitable respirator when high concentrations are present.**Protection of hands:**

Impervious gloves

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Check protective gloves prior to each use for their proper condition.

Material of gloves

The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.

Eye protection: Safety glasses**Body protection:** Protective work clothing.**9 Physical and chemical properties****Information on basic physical and chemical properties****General Information****Appearance:**

Form:	Liquid
Color:	Colorless
Odor:	Pungent
Odour threshold:	Not determined.

pH-value (300 g/l) at 20°C (68 °F):	6
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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:	75°C (167 °F)
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Flammability (solid, gaseous)	Not applicable.
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Ignition temperature:	390°C (734 °F)
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Decomposition temperature:	Not determined
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Auto igniting:	Not determined.
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Danger of explosion:	Product does not present an explosion hazard.
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Explosion limits:

Lower:	1.8 Vol %
Upper:	16.3 Vol %

Vapor pressure at 20°C (68 °F):	0.53 hPa
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Density at 20°C (68 °F):	1.135 g/cm ³ (9.472 lbs/gal)
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Relative density	Not determined.
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Vapour density	Not determined.
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Evaporation rate	Not determined.
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Solubility in / Miscibility with Water:	Fully miscible
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Segregation coefficient (n-octanol/water):	Not determined.
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Viscosity:

dynamic at 25°C (77 °F):	5 mPas
kinematic:	Not determined.

Other information	No further relevant information available.
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10 Stability and reactivity**Reactivity****Chemical stability****Thermal decomposition / conditions to be avoided:**

Decomposition will not occur if used and stored according to specifications.

Possibility of hazardous reactions No dangerous reactions known**Incompatible materials:** Oxidizing agents**Hazardous decomposition products:** Carbon monoxide and carbon dioxide**11 Toxicological information****Information on toxicological effects****Acute toxicity:****LD/LC50 values that are relevant for classification:**

Oral	LD50	275 mg/kg (rat)
Dermal	LD50	3825 mg/kg (rat)
		657 mg/kg (rabbit)

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Inhalative	LC50/4H	952 mg/m3/4H (rat) 233 ppm/4H (rat)
Irritation of eyes	moderate	100 mg/24H (rabbit)

Primary irritant effect:**on the skin:** May cause irritation**on the eye:** Irritating effect.**Sensitization:** No sensitizing effects known.**Other information (about experimental toxicology):**

Tumorigenic effects have been observed on tests with laboratory animals.

Subacute to chronic toxicity:**Subacute to chronic toxicity:**

The Registry of Toxic Effects of Chemical Substances (RTECS) reports the following effects in laboratory animals:

Behavioral - excitement.

Behavioral - ataxia.

Behavioral - convulsions or effect on seizure threshold.

Lungs, Thorax, or Respiration - cyanosis.

Sense Organs and Special Senses (Olfaction) - effect, not otherwise specified.

Sense Organs and Special Senses (Olfaction) - tumors.

Kidney, Ureter, Bladder - Kidney tumors.

Related to Chronic Data - death.

Biochemical - Enzyme inhibition, induction, or change in blood or tissue levels - dehydrogenases.

Biochemical - Enzyme inhibition, induction, or change in blood or tissue levels - other transferases.

Biochemical - Enzyme inhibition, induction, or change in blood or tissue levels - transaminases.

Brain and Coverings - recordings from specific areas of CNS.

Blood - changes in serum composition (e.g. TP, bilirubin, cholesterol).

Tumorigenic - active as anti-cancer agent.

Tumorigenic - carcinogenic by RTECS criteria.

Tumorigenic - equivocal tumorigenic agent by RTECS criteria.

Subacute to chronic toxicity:

Furfuryl alcohol causes headache, nausea on exposure. May cause irritation of the digestive tract, skin or respiratory tract. Will cause eye inflammation and corneal opacity. Chronic effects include central nervous system effects and kidney injury.

Additional toxicological information:

To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

Danger through skin absorption.

Carcinogen as defined by OSHA.

12 Ecological information**Toxicity****Aquatic toxicity:** No further relevant information available.**Persistence and degradability** No further relevant information available.**Behavior in environmental systems:****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 of it to reach ground water, water course or sewage system.

Do not allow material to be released to the environment without proper governmental permits.

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.

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14 Transport information**DOT regulations:**

Hazard class: 6.1
Identification number: UN2874
Packing group: III
Proper shipping name (technical name): FURFURYL ALCOHOL
Label: 6.1

Land transport ADR/RID (cross-border)

ADR/RID class: 6.1 (T1) Toxic substances
Danger code (Kemler): 60
UN-Number: 2874
Packaging group: III
UN proper shipping name: 2874 FURFURYL ALCOHOL

Maritime transport IMDG:

IMDG Class: 6.1
UN Number: 2874
Label: 6.1
Packaging group: III
EMS Number: F-A, S-A
Marine pollutant: No
Proper shipping name: FURFURYL ALCOHOL

Air transport ICAO-TI and IATA-DGR:

ICAO/IATA Class: 6.1
UN/ID Number: 2874
Label: 6.1
Packaging group: III
Proper shipping name: FURFURYL ALCOHOL

UN "Model Regulation": UN2874, FURFURYL ALCOHOL, 6.1, III

Special precautions for user Warning: Toxic substances

Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code Not applicable.

15 Regulatory information

Safety, health and environmental regulations/legislation specific for the substance or mixture

Product related hazard informations:**Hazard symbols:**

T Toxic

Risk phrases:

21/22 Harmful in contact with skin and if swallowed.

23 Toxic by inhalation.

36/37 Irritating to eyes and respiratory system.

40 Limited evidence of a carcinogenic effect.

48/20 Harmful: danger of serious damage to health by prolonged exposure through inhalation.

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Safety phrases:

36/37 Wear suitable protective clothing and gloves.

45 In case of accident or if you feel unwell, seek medical advice immediately.

63 In case of accident by inhalation: remove casualty to fresh air and keep at rest

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).

Information about limitation of use: For use only by technically qualified individuals.**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 Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Department issuing MSDS: Health, Safety and Environmental Department.**Contact:**

Zachariah C. Holt

Global EHS Manager

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)

RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)

ICAO: International Civil Aviation Organization

ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO)

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

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