



Safety Data Sheet
according to Regulation (EC) No 1907/2006

Furfuryl alcohol

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

1.1 Product identifier

| | | | |
|----------------------------|--|---------------------|--------------|
| Chemical name | 2-Furanmethanol | | |
| Synonyms | Furan-2-ylmethanol, 2-Furan carbinol, Furfural alcohol, 2-Furyl carbinol, 2-Furyl methanol, 2-Hydroxymethyl furan. | | |
| Formula | C ₅ H ₆ O ₂ | | |
| Molecular mass | 98,10 | FL-No. | 13.019 |
| CAS-No. | 98-00-0 | FEMA-No. | 2491 |
| EC-No. | 202-626-1 | Annex VI-No. | 603-018-00-2 |
| Registration number | 01-2119493965-18-0004 | | |

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

| Relevant identified uses of the substance or mixture | Exposure scenario |
|---|-------------------|
| – Manufacturing of blends / formulation | ES 2 |
| – Manufacturing of polymers | ES 3 |
| – Manufacturing of moulds using formulations containing the substance (foundry) | ES 4 |
| – Manufacturing of refractories, abrasive wheels, friction (brake pads, clutch facing), carbon impregnation using formulations containing the substance | ES 5 |
| – Wood impregnation / modification | ES 6 |
| – Professional end-use of acid resistant coating | ES 7 |
| Uses advised against | None |

1.3 Details of the supplier of the safety data sheet

| | |
|-------------------------|---|
| Company | Everchem Specialty Chemicals |
| Address | 1400 N. Providence Rd. Media, PA 19063 |
| Telephone number | 484-234-5030 |

1.4 Emergency telephone numbers

| | |
|-----------------------|--------------------------------------|
| Emergency | |
| – Local United States | Chemtrec 800-424-9300 (24 Hr Number) |
| – International | Chemtrec 703-527-3887 |

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

According to Regulation (EC) No. 1272/2008 (EU-GHS / CLP)

Hazard Classes / Hazard Class-, Category- and -Statement Codes

| | |
|--|---------------------|
| Acute toxicity | Acute Tox. 2, H330 |
| Acute toxicity | Acute Tox. 3, H301 |
| Acute toxicity | Acute Tox. 3, H311 |
| Eye irritation | Eye Irrit. 2, H319 |
| Skin irritation | Skin Irrit. 2, H315 |
| Carcinogenicity | Carc. 2, H351 |
| Specific target organ toxicity – single exposure | STOT SE 3, H335 |
| Specific target organ toxicity – repeated exposure | STOT RE 2, H373 |

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According to Directive 67/548/EEC (EU DSD / DPD)

Indications of danger and classification

| | |
|-----------------|-------------------|
| Carcinogenicity | Carc. Cat. 3; R40 |
| Toxic | T; R23 |
| Harmful | Xn; R21/22-48/20 |
| Irritant | Xi; R36/37/38 |

Essential adverse effects

The substance is toxic by inhalation and if swallowed and is harmful in contact with skin. Irritating to eyes, respiratory system and skin.

2.2 Label elements

According to Regulation (EC) No. 1272/2008 (CLP)

Hazard pictograms



Signal word

Danger

Hazard statements

| | |
|------|--|
| H330 | Fatal if inhaled. |
| H301 | Toxic if swallowed. |
| H311 | Toxic in contact with skin. |
| H319 | Causes serious eye irritation. |
| H315 | Causes skin irritation. |
| H335 | May cause respiratory irritation. |
| H351 | Suspected of causing cancer. |
| H373 | May cause damage to respiratory - nasal tissue through prolonged or repeated exposure by inhalation. |

Precautionary statements

| | |
|----------------------|--|
| P201 | Obtain special instructions before use. |
| P271 | Use only outdoors or in a well-ventilated area. |
| P280 * | Wear protective gloves / protective clothing / eyeprotection. |
| P403 + P233 * | Store in a well-ventilated place. Keep container tightly closed. |
| P304 + P340 * | IF INHALED: Remove person to fresh air and keep comfortable for breathing. |
| P301 + P310 * | IF SWALLOWED: Immediately call a POISON CENTER / doctor / physician. |
| P302 + P352 | IF ON SKIN: Wash with plenty of soap and water. |
| 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. |
| P501 | Dispose of contents / container to a specialised processing facility for disposal in accordance with local / regional regulations. |

* on label

2.3 Other hazards

Furfuryl alcohol does not meet the criteria for PBT or vPvB according to Regulation 1907/2006.

SECTION 3: Composition / information on ingredients

3.1 Substances

| Main constituent | Identity | Percentage |
|---|-------------------------------------|--------------------|
| Furfuryl alcohol | CAS-No. 98-00-0 EC-No. 202-626-1 | ≥ 97.0 - ≤ 100.0 % |
| Classified impurities or stabilizers | None | |

SECTION 4: First aid measures

4.1 Description of first aid measures

| | |
|---------------------|--|
| Inhalation | Fresh air, rest, half upright position. Get medical advice / attention if you feel unwell. |
| Skin contact | Remove contaminated clothes, rinse skin with water or shower. If skin irritation occurs: get medical advice / attention. |
| Eye contact | First rinse with plenty of water (remove lenses if possible). If eye irritation persists: get |

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Ingestion medical advice / attention.
Rinse mouth. Immediately call a doctor / physician if you feel unwell.

- 4.2 Most important symptoms and effects, both acute and delayed**
Respiratory irritation (nose and upper respiratory tract). Eye and skin irritation.
- 4.3 Indication of any immediate medical attention and special treatment needed**
Information on medical attendance
Not necessary.
Special means to provide treatment at the workplace
Not necessary.

SECTION 5: Firefighting measures

- 5.1 Extinguishing media**
Suitable extinguishing media
Powder, water spray, alcohol-resistant foam, carbon dioxide.
Unsuitable extinguishing media
Alcohol unstable foam.
- 5.2 Special hazards arising from the substance or mixture**
Hazardous combustion products
May produce toxic fumes of carbon monoxide if burning.
Additional hazards
Extreme generation of heat in the case of larger fires.
- 5.3 Advice for fire-fighters**
Protective actions
In case of fire: keep containers cool by spraying with water.
Retain contaminated extinguishing water; do not allow entering into the sewage system.
In the case of larger fires: Cordon affected area.
Special protective equipment
Self-contained respiratory protective device.

SECTION 6: Accidental release measures

- 6.1 Personal precautions, protective equipment and emergency procedures**
Information for non-emergency personnel
In the case of large quantities: Use filter respirator for organic vapours (filter type A).
Use personal protective equipment to avoid any contamination of skin, eyes and personal clothes. Remove potential sources of ignition. Do not smoke.
Assure sufficient ventilation.
Information for emergency responders
If available, observe corporate hazard-control and emergency plans.
- 6.2 Environmental precautions**
In the case of spills: Avoid penetration into the sewage canal, surface water and ground water.
In the case of accidental release: Do not discharge in surface water, sewers or soil.
- 6.3 Methods and material for containment and cleaning up**
Advice on spillage containment
Take up small amounts spilled product with an inert absorbent. Dispose of as hazardous waste.
Dam spilled substance in and suck carefully; recycle if possible.
Appropriate clean-up procedures
Collect remainder in inert absorbent and dispose of as hazardous waste. Wash away remainder with water.
Inappropriate containment or clean-up techniques
None known.
- 6.4 Reference to other sections**
See also the sections 8 and 13.
-

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SECTION 7: Handling and storage

7.1 Precautions for safe handling

Recommendations for safe handling

Use only in well ventilated areas.
Only transfer into suited and resistant containers. Containers have to be properly labelled.
Above 65 °C: use in a closed system.

Advice on general occupational hygiene

The usual precautionary measures when handling chemicals have to be observed.
Do not eat, drink and smoke in work areas. Wash hands thoroughly with water and soap.

7.2 Conditions for safe storage, including any incompatibilities

Protection against incompatible substances

Keep away from oxidants and strong acids. The substance affects many synthetic materials; store only in original packing.
Keep container tightly closed.

Protection against ambient influences

Protect against heat and solar radiation. Recommended storage temperature: 20 °C.
Store in a dark area.

Maintenance of the integrity of the substance

Not required.

7.3 Specific end uses

If used in food: comply with food safety regulation (HACCP).

SECTION 8 Exposure controls / personal protection

8.1 Control parameters

| Country | Limit values | | | | Notation |
|----------------|--------------------------------------|-----|---------------------------------------|----------|---------------------------------|
| | 8 hours (TWA) | | Short term (15 min.) | | |
| | mg/m ³ | ppm | mg/m ³ | ppm | |
| Austria | 20 | 5 | | | skin |
| Belgium | 41 | 10 | 61 (TWA) | 15 (TWA) | skin |
| Czech Republic | 20 | 5 | 40 | 10 | C (40 mg/m ³), skin |
| Denmark | 20 | 5 | n.d. | | skin |
| Finland | 8,1 | 2 | 41 | 10 | |
| France | 40 | 10 | n.d. | | |
| Germany | 41 | 10 | 41 (TWA) | 10 (TWA) | skin |
| Italy | n.d.(previous 20 mg/m ³) | | n.d.(previous 61 mg/m ³) | | |
| Netherlands | n.d.(previous 20 mg/m ³) | | n.d.(previous 200 mg/m ³) | | |
| Norway | 20 | 5 | n.d. | | skin |
| Poland | 30 | 7,5 | 60 | 15 | |
| Portugal | 40 | 10 | 60 | 15 | skin |
| Slovakia | 41 | 10 | n.d. | | C (41 mg/m ³), skin |
| Slovenia | 41 | 10 | n.d. | | skin |
| Spain | 20 | 5 | 61 (TWA) | 15 (TWA) | skin |
| Sweden | 20 | 5 | 40 (TWA) | 10 (TWA) | skin |
| Switzerland | 40 | 10 | 40 (TWA) | 10 (TWA) | skin |
| United Kingdom | n.d.(previous 20 mg/m ³) | | n.d.(previous 61 mg/m ³) | | |

n.d. not determined

The exposure limits may be exceeded before the odour is perceived.

DNEL / DMEL

Workers short term exposition

| | |
|--|-----------------------|
| DNEL worker (acute, inhalation - systemic) | 143 mg/m ³ |
| DNEL worker (acute, inhalation - local) | 8 mg/m ³ |

Workers long term exposition

| | |
|--|----------------------|
| DNEL worker (long-term, inhalation - systemic) | 31 mg/m ³ |
| DNEL worker (long-term, inhalation - local) | 8 mg/m ³ |
| DNEL worker (long-term, dermal - systemic) | 4 mg/kg bw/day |

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Consumers short term exposition

| | |
|--|-------------------------|
| DNEL general population (acute, inhalation - systemic) | 128.5 mg/m ³ |
| DNEL general population (acute, inhalation - local) | 8 mg/m ³ |
| DNEL general population (acute, oral - systemic) | 2.4 mg/kg |

Consumers long term exposition

| | |
|--|-----------------------|
| DNEL general population (long-term, inhalation - systemic) | 9.3 mg/m ³ |
| DNEL general population (long-term, inhalation - local) | 8 mg/m ³ |
| DNEL general population (long-term, oral - systemic) | 2.4 mg/kg bw/day |
| DNEL general population (long-term, dermal - systemic) | 2.4 mg/kg bw/day |

PNEC

Aquatic

| | | |
|-------------------------------|-------------------------------------|------------|
| – <i>fresh water</i> | PNEC aquatic (freshwater) | 0.17 mg/L |
| – <i>marine water</i> | PNEC aquatic (marine water) | 0.017 mg/L |
| – <i>intermittent release</i> | PNEC aquatic (intermittent release) | 1.7 mg/L |

Sedimentary

| | | |
|--------------------------------|----------------------|--------------------------|
| – <i>fresh water sediment</i> | PNEC sediment | 0.861 mg/kg sediment dw |
| – <i>marine water sediment</i> | PNEC marine-sediment | 0.0861 mg/kg sediment dw |

Terrestrial

| | | |
|---------------|-----------|----------------------|
| – <i>soil</i> | PNEC soil | 0.0724 mg/kg soil dw |
|---------------|-----------|----------------------|

Secondary poisoning

| | | |
|---------------------|-----------|-----------------|
| – <i>food chain</i> | PNEC oral | 35.3 mg/kg food |
|---------------------|-----------|-----------------|

Potential to bioaccumulate in the food chain is not applicable (logKow <3).

8.2 Exposure controls

8.2.1 Appropriate engineering controls

Ventilation and local exhaust.

8.2.2 Individual protection measures, such as personal protective

a) Eye/face protection

Safety goggles (EN 166).

b) Skin protection

Hand protection

Gloves butyl rubber 0.7 mm Breakthrough time > 8 hours (EN 374)

Gloves neoprene 0.75 mm Breakthrough time > 4 hours (EN 374)

Other

Protective clothing.

c) Respiratory protection

In case of insufficient local exhaust: filter respirator for organic vapours (filter type A) (EN 14387).

d) Thermal hazards

Not applicable.

8.2.3 Environmental exposure controls

Direct polluted air of the local exhaust ventilation out of the plant in a manner in accordance with environmental regulations.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

Clear colourless liquid that turns from yellow and brown to dark red on exposure to light and air.

Odour

Characteristic: slightly pungent.

Odour threshold (mg/m³)

33

pH (30% solution)

4-6

Melting point / freezing point (°C)

- 14.6

Boiling point (°C) at 1013 hPa

171

Flash point (°C)

65 (closed cup)

Evaporation rate (ether=1)

443

Upper / lower explosive limits (vol%)

1.8 - 16.3

Vapour pressure at 20 °C (Pa)

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| | |
|---|---------------|
| Vapour density (air=1) | 3.38 |
| Relative density (water=1) | 1.13 |
| Solubility(ies) | |
| – Solubility in water at 20 °C (g/l) | Miscible |
| – Solubility in fat | Good |
| Partition coefficient (log K octanol/water) | 0.3 |
| Auto-ignition temperature (°C) | 490 |
| Decomposition temperature | Not available |
| Viscosity at 25 °C (mPa.s) | 4.62 |
| Explosive properties | Non explosive |
| Oxidising properties | None |

9.2 Other information

| | |
|---------------------------------|--|
| Miscibility with | Solvents (ethanol, benzene, chloroform, ether) |
| Conductivity (pS/m) | Not available. |
| Heat of combustion (kJ/kg) | 26 000 |
| Surface tension at 25 °C (mN/m) | 38 |

SECTION 10: Stability and reactivity

10.1 Reactivity

Risk of polymerization.

10.2 Chemical stability

Discolours on exposure to light. Unstable in water.

10.3 Possibility of hazardous reactions

Exothermic polymerization with explosive violence in the presence of (strong) acids.
Reacts violently with oxidants.

10.4 Conditions to avoid

Contact with direct sunlight, heat sources and air.
Temperatures in storage > 40 °C should be avoided.

10.5 Incompatible materials

Oxidants (violent reaction) and strong acids (polymerization).

10.6 Hazardous decomposition products

Upon decomposition emits carbon monoxide, carbon dioxide and/or low molecular weight hydrocarbons.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

a) Acute Toxicity

| | | |
|---------------------|---------------------|--------------------|
| – <i>Oral</i> | LD50 (rat) | 132 - 275 mg/kg |
| – <i>Dermal</i> | LD50 (rabbit) | 400 - 657 mg/kg |
| – <i>Inhalation</i> | LC50 (rat, 4 hours) | 0.820 – 2.070 mg/L |
| | NOAEC | 0.510 mg/L |

b) Skin corrosion/irritation

The substance is irritating to skin.

c) Serious eye damage/irritation

The substance is irritating to eyes.

d) Respiratory or skin sensitisation

No adverse effect observed (not sensitising).

e) Germ cell mutagenicity

No adverse effect observed (negative).

f) Carcinogenicity

| | |
|--------------------|----------------------|
| NOAEL (oral) | 53 mg/kg bw/day |
| Target organ(s): | digestive; liver. |
| LOAEC (inhalation) | 8 mg/ m ³ |
| Target organ(s): | respiratory: nose. |

Suspected of causing cancer. Two-year inhalation carcinogenicity studies provide limited evidence of carcinogenicity at dose levels associated with systemic toxicity and

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only in tissues which exhibit significant tissue damage (i. e. nose and kidney).

g) Reproductive toxicity

– **Fertility/developmental**

No effect of furfuryl alcohol on estrous cyclicity or on sperm parameters in rats or mice at exposure concentrations of up to 128 mg/m³. Not warranted to be a reprotoxin.

h) Specific target organ toxicity – single exposure

– **Respiratory tract**

The substance may cause respiratory irritation.

i) Specific target organ toxicity – repeated exposure

– **Respiratory tract**

Signs of respiratory tract (specifically nasal) irritation were seen in rats after repeated exposure.

j) Aspiration hazard

Based on available data, the classification criteria for this hazard class are not met.

11.2 Likely routes of exposure

Furfuryl alcohol can be absorbed via the oral route and via the dermal and inhalation routes. Furfuryl alcohol is extensively and rapidly oxidised to furfural.

SECTION 12: Ecological information

12.1 Toxicity

Aquatic compartment and sediment

– **Fish**

LC50 (fresh water, 96 h) 362 mg/L

– **Aquatic invertebrates**

EC50 (Daphnia, fresh water, 48 h) 224 mg/L

– **Algae and aquatic plants**

EC50/LC50 (algae, fresh water, 96 d) 170 mg/L

NOEC (algae, fresh water, 7 d) 25 mg/L

– **Sediment organisms**

Not a relevant compartment.

Terrestrial compartment

Not a relevant compartment.

12.2 Persistence and degradability

Biodegradability

– **Biodegradability in water**

Readily biodegradable.

– **Biochemical oxygen demand**

BOD (14 days) 77.7% degradation

12.3 Bioaccumulation potential

Aquatic bioaccumulation

No remarkable bioaccumulation potential (log K_{ow} 0.3).

12.4 Mobility in soil

Adsorption/desorption

Highly mobile (K_{oc} 34)

Volatilisation

0.0070 (in Pa.m³/mol)

Henry constant at 20 °C

12.5 Results of PBT and vPvB assessment

The substance does not meet the PBT and vPvB criteria according to annex XIII of Regulation (EC) No 1907/2006.

12.6 Other information

Water hazard class (WGK Germany)

1 (slightly hazardous to water)

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product disposal

Recycling by distillation.

Removal to an authorized waste incinerator for solvents or as chemical waste in

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| | |
|---|---|
| Packaging disposal | accordance with local regulations. Do not discharge wastewater into sewer. |
| Waste treatment-relevant information | Uncleaned empty package have to be treated like the content. The labelling of uncleaned containers must not be removed. European waste list (EURAL) 07 01 04 |

SECTION 14: Transport information

| | |
|--|------------------|
| 14.1 UN No. | 2874 |
| 14.2 UN proper shipping name | FURFURYL ALCOHOL |
| 14.3 Transport hazard class(es) | 6.1 |
| 14.4 Packinggroup | III |
| 14.5 Environmental hazards | |
| Marine pollutant | No |
| 14.6 Specials precautions for user | |
| Classification code | T1 |
| Risk label(s) | 6.1 |
| Tunnel category | (E) |
| Hazard Identification Number (Kemler code) | 60 |
| Limited quantity (LQ) | 5L |
| Excepted quantity | E1 |
| ERICard | 6-03 |
| Emergency Schedules (EmS) | |
| – Fire schedule | Alfa (F - A) |
| – Spillage schedule | Alfa (S - A) |
| 14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code | |
| Ship type required | 3 |
| Pollution category | Y |

SECTION 15: Regulatory information

| | |
|--|---|
| 15.1 Safety, health and environmental regulations / legislation specific for the substance or mixture | Approved as a flavouring agent in the EU FL No 13.019 (Regulation (EC) No 2232/96). |
| 15.2 Chemical safety assessment | A Chemical Safety Assessment has been carried out for furfuryl alcohol. |

SECTION 16: Other information

| | |
|---|--|
| 16.1 Changes to the previous version | |
| Previous version | 25 |
| Changes | Replacement of 'Regulation (EU) No 453/2010' by 'Regulation (EC) No 1907/2006' in the header. Addition of 'SECTION' in the headings. Adaptation of the Emergency telephone numbers. Addition of the subheading '3.1 Substances'. Addition of 'Revision: (date)' in the footer. Addition of the numbers of the European standards for respiratory protection. Adaptation of P-phrases according to the 4 th ATP of Regulation (EC) No.1272/2008. Deleting of 'Secondary poisoning' from subheading 12.1. Moving of 'Oxygen demand' from subheading 12.6 to 12.2. |
| 16.2 Abbreviations and acronyms | |
| DNEL | Derived No Effect Level |
| DSD / DPD | Dangerous Substances Directive / Dangerous Preparations Directive |
| EC50 | Effect Concentration, 50 percent |
| ERICard | Emergency Response Intervention Card |

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|-----------|--|
| GHS / CLP | Globally Harmonised System / Classification, Labelling and Packaging |
| IC50 | Inhibitory Concentration, 50 percent |
| LC50 | Lethal Concentration, 50 percent |
| LD50 | Lethal Dose, 50 percent |
| LOAEC | Lowest observed adverse effect concentration |
| NOAEC | No observed adverse effect concentration |
| NOAEL | No observed adverse effect level |
| NOEC | No observed effect concentration |
| NOEL | No observed effect level |
| PBT | Persistent, Bioaccumulative and Toxic |
| PNEC | Predicted No Effect Concentration |
| TWA | Time Weighted Average |
| vPvB | very Persistent and very Bioaccumulative |

16.3 Literature references and sources for data

REACH dossier.

16.4 Full text of R-phrases and hazard statements which are not written out in full under Sections 2 to 15

| | |
|-----------|---|
| R21/22 | Harmful in contact with skin and if swallowed. |
| R23 | Toxic by inhalation. |
| R36/37/38 | Irritating to eyes, respiratory system and skin. |
| R40 | Limited evidence of a carcinogenic effect. |
| R48/20 | Harmful: danger of serious damage to health by prolonged exposure through inhalation. |

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