



AN ILLOVO SUGAR AFRICA COMPANY

# Furfuryl alcohol

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

### 1.1 Product identifier

<b>Chemical name</b>	2-Furanmethanol		
<b>Synonyms</b>	Furan-2-ylmethanol, 2-Furan carbinol, Furfural alcohol, 2-Furyl carbinol, 2-Furyl methanol, 2-Hydroxymethyl furan.		
<b>Formula</b>	C <sub>5</sub> H <sub>6</sub> O <sub>2</sub>		
<b>Molecular mass</b>	98,10	<b>FL-No.</b>	13.019
<b>CAS-No.</b>	98-00-0	<b>FEMA-No.</b>	2491
<b>EC-No.</b>	202-626-1	<b>Annex VI-No.</b>	603-018-00-2
<b>Registration number</b>	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
<b>Uses advised against</b>	None

### 1.3 Details of the supplier of the safety data sheet

<b>Manufacturer</b>	Illovo Sugar (South Africa) (Pty) Ltd		
<b>Address</b>	1 Nokwe Avenue Ridgeside Umhlanga Rocks South Africa 4320		
<b>Telephone number</b>	+27 31 508 45 88		
<b>E-mail address</b>	<a href="mailto:commercialdownstreamsds@illovo.co.za">commercialdownstreamsds@illovo.co.za</a>		
<b>Only representative</b>	Otentic Customs BV		
<b>Address</b>	Zeilmakerijweg 8, 4906 CW Oosterhout, The Netherlands		
<b>Telephone number</b>	+31 162 48 80 50		

### 1.4 Emergency telephone numbers

<b>Emergency</b>		
- <b>Local South Africa</b>	0800 17 27 43	Rapid Spill Response
- <b>International</b>	+27 82 775 33 05	
<b>Medical information</b>		
- <b>South Africa</b>	+27 824 910 160	Bloemfontein Poison Control and Medicine Information Centre
- <b>South Africa</b>	+27 861 555 777	Poisons Information Helpline of the Western Cape
- <b>United Kingdom</b>	844 892 0111	National Poisons Information Service

## 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. 3, H301 + H311 + H331
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

For full text of Hazard statements: see subsection 2.2.

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## 2.2 Label elements Hazard pictograms



### Signal word

Danger

### Hazard statements

H301 + H311 + H331

Toxic if swallowed, in contact with skin or if inhaled.

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 / eye protection.

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

Furfuryl alcohol

#### Identity

CAS-No. 98-00-0  
EC-No. 202-626-1

#### Percentage

≥ 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 medical advice / attention.

#### Ingestion

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.



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## 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 with filter type A for organic vapours.  
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.

## 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.



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## 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
	TWA-8 hours		TWA-15 min.		
	mg/m <sup>3</sup>	ppm	mg/m <sup>3</sup>	ppm	
Austria	20	5	n.d.		skin
Belgium	41	10	61	15	skin
Czech Republic	20				C (40 mg/m <sup>3</sup> )
Denmark	20	5	40	10	skin
Finland	8,1	2	41	10	
France	40	10	n.d.		
Germany	cancelled		cancelled		
Italy	cancelled		cancelled		
Netherlands	cancelled		cancelled		
Norway	20	5	n.d.		skin
Poland	30		60		
Portugal		10		15	Skin
Slovakia		10	n.d.		C (41 mg/m <sup>3</sup> )
Slovenia	41	10	n.d.		
Spain	20	5	61	15	skin
Sweden	20	5	40	10	skin
Switzerland	40	10	40	10	skin
United Kingdom	cancelled		cancelled		

n.d. not determined

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

### DNEL / DMEL

#### Workers short term exposition

DNEL <sub>worker</sub> (acute, inhalation - systemic)	143 mg/m <sup>3</sup>
DNEL <sub>worker</sub> (acute, inhalation - local)	8 mg/m <sup>3</sup>

#### Workers long term exposition

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

#### Consumers short term exposition

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

#### Consumers long term exposition

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



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<b>PNEC</b>		
<b>Aquatic</b>		
- <i>fresh water</i>	PNEC <sub>aquatic</sub> (freshwater)	0.17 mg/L
- <i>marine water</i>	PNEC <sub>aquatic</sub> (marine water)	0.017 mg/L
- <i>intermittent release</i>	PNEC <sub>aquatic</sub> (intermittent release)	1.7 mg/L
<b>Sedimentary</b>		
- <i>fresh water sediment</i>	PNEC <sub>sediment</sub>	0.861 mg/kg sediment dw
- <i>marine water sediment</i>	PNEC <sub>marine-sediment</sub>	0.0861 mg/kg sediment dw
<b>Terrestrial</b>		
- <i>soil</i>	PNEC <sub>soil</sub>	0.0724 mg/kg soil dw
<b>Secondary poisoning</b>		
- <i>food chain</i>	PNEC <sub>oral</sub>	35.3 mg/kg food
	Potential to bioaccumulate in the food chain is not applicable (log Kow <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

Full contact:

Gloves butyl rubber 0.7 mm

Breakthrough time > 8 hours (EN374)

Gloves neoprene 0.75 mm

Breakthrough time > 4 hours (EN374)

Splash contact:

Gloves natural rubber/latex 1.2 mm

Breakthrough time < 10 min. (EN374)

##### Other

Protective clothing (EN 340/EN 14605).

#### c) Respiratory protection

In case of insufficient local exhaust: filter respirator with filter type A for organic vapours (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

<b>Appearance</b>	Clear colourless liquid that turns from yellow and brown to dark red on exposure to light and air.
<b>Odour</b>	Characteristic: slightly pungent.
<b>Odour threshold (mg/m<sup>3</sup>)</b>	33
<b>pH (30% solution)</b>	4 - 6
<b>Melting point / freezing point (°C)</b>	- 14.6
<b>Boiling point (°C) at 1013 hPa</b>	171
<b>Flash point (°C)</b>	65 (closed cup)
<b>Evaporation rate (ether=1)</b>	443
<b>Lower/upper explosive limits (vol%)</b>	1.8 - 16.3
<b>Vapour pressure at 20 °C (hPa)</b>	0.53
<b>Vapour density (air=1)</b>	3.38
<b>Relative density (water=1)</b>	1.13
<b>Solubility(ies)</b>	
- Solubility in water at 20 °C (g/l)	Miscible
- Solubility in fat	Good
<b>Partition coefficient (log K octanol/water)</b>	0.3
<b>Auto-ignition temperature (°C)</b>	490



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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)	1.17 mg/L (aerosol)

#### 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 <sup>3</sup>
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 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/m<sup>3</sup>. Not warranted to be a reprotoxin.

#### h) Specific target organ toxicity – single exposure

##### - *Respiratory tract*

The substance may cause respiratory irritation.





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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

Henry's Law constant at 20 °C 0.0079 (in Pa m<sup>3</sup>/mol)

### 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 adverse effects

Slightly hazardous to water (Water hazard class 1, WGK Germany)

## 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 accordance with local regulations. Do not discharge wastewater into sewer.

#### Packaging disposal

Uncleaned empty package have to be treated like the content. The labelling of uncleaned containers must not be removed.

#### Waste treatment-relevant information

European waste list (EURAL) 07 01 04



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### 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 (IMO/IMDG)	No
	Hazards for tank vessels (ADN)	6.1+N3
14.6	Specials precautions for user	
	Classification code (ADR/RID/ADN)	T1
	Risk label(s) (ADR/RID/ADN/IMDG/IATA)	6.1
	Tunnel restriction code (ADR/RID)	(E)
	Hazard Identification No. (ADR/RID)	60
	Limited quantity (ADR/RID/ADN/IMDG/IATA)	5 L
	Excepted quantity (ADR/RID/ADN/IMDG/IATA)	E1
	ERICard (ADR)	6-03
	Emergency Schedules (IMDG)	
	- Fire schedule	Alfa (F - A)
	- Spillage schedule	Alfa (S - A)
14.7	Transport in bulk according to Annex II of Marpol and the IBC Code	
	Ship type required (IMDG)	3
	Pollution category (IMDG)	Y

### SECTION 15: Regulatory information

#### 15.1 Safety, health and environmental regulations / legislation specific for the substance or mixture Authorisations (REACH)

Not subject to Title VII of Regulation (EC) No 1907/2006

#### Restrictions (REACH), SVHC

Annex XVII of Regulation (EC) No 1907/2006 is not applicable.  
SVHC (Substance of Very High Concern) status: negative.

#### Control of major-accident hazards (Seveso III)

Subject to Directive 2012/18/EU.

Hazard category	H2 ACUTE TOXIC
Qualifying quantity column 2:	50 000 kg
Qualifying quantity column 3:	200 000 kg

#### List of flavouring substances

Approved as a flavouring agent (Regulation (EC) No 872/2012).

#### Classification, labelling and packaging

Regulation (EC) No 1272/2008 (CLP-Regulation)

#### Other EU-/national regulations

Other applicable EU-/national regulations have to be observed.

#### 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	26.5
Changes	Change of the e-mail address and addition of the language code.

#### 16.2 Abbreviations and acronyms

ADN	Transport of dangerous goods by inland waterways
ADR	Transport of dangerous goods by road
DNEL	Derived No Effect Level
EC50	Effect Concentration, 50 percent





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ERICard	Emergency Response Intervention Card
GHS / CLP	Globally Harmonised System / Classification, Labelling and Packaging
IC50	Inhibitory Concentration, 50 percent
IATA	Transport of dangerous goods by air
IMDG	Transport of dangerous goods by sea
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
RID	Transport of dangerous goods by rail
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 hazard statements which are not written out in full under Sections 2 to 15

None.

This data sheet has been compiled by KWA. Despite the careful attention paid to the setting up of the text, KWA cannot be held responsible for any error appearing in the text and resulting in whatever damage it may cause.  
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