

# SAFETY DATA SHEET

Based on Directive 2001/58/EC of the Commission of the European Communities

## FURFURYL ALCOHOL

### 1. Identification of the substance/preparation and of the company/undertaking

#### 1.1 Identification of the substance or preparation:

**Synonyms:** 2-furan carbinol; 2 hydroxymethylfuran; 2-furan methanol

**CAS No.** : 98-00-0  
**EC index No.** : 603-018-00-2 **NFPA code** : 3-2-1  
**EINECS No.** : 202-626-1 **Molecular weight** : 98.10  
**RETCS No.** : LU9100000 **Formula** : C<sub>5</sub>H<sub>6</sub>O<sub>2</sub>

#### 1.2 Use of the substance or the preparation:

Raw material for chemistry  
Application in resins  
Application in foundry, colour, lac, synthetic and electro industry  
Application in cover materials  
Application in pharmaceutical products

#### 1.3 Company/undertaking identification:

International Furan Chemicals B.V.  
Rotterdam Airportplein 7  
3045 AP Rotterdam (The Netherlands)  
Tel.: +31 10 238 05 55  
Fax : +31 10 238 05 50

#### 1.4 Telephone number for emergency:

+32 14 58 45 45  
Brandweerinformatiecentrum voor gevaarlijke stoffen (B.I.G.)  
Technische Schoolstraat 43 A, B-2440 Geel

### 2. Composition/information on ingredients

Hazardous ingredients	CAS No. EINECS No.	Conc. in %	Hazard symbol	Risks (R-phrases)
furfuryl alcohol	98-00-0 202-626-1	>98	Xn	20/21/22 (1)

(1) For R-phrases in full: see heading 16

### 3. Hazards identification

- Harmful by inhalation, in contact with skin and if swallowed
- Acute overexposure: irritating to eyes, skin and/or respiratory tract.

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## 4. First aid measures

- 4.1 Eye contact:**
- Rinse immediately with plenty of water
  - Do not apply neutralizing agents
  - If irritation persists: consult a doctor/medical service
- 4.2 Skin contact:**
- Soap may be used
  - Rinse immediately with plenty of water
  - Remove clothing before washing
  - If irritation persists: consult a doctor/medical service
- 4.3 After inhalation:**
- Remove the victim into fresh air
  - Unconscious: maintain adequate airway and respiration
  - If breathing problems develop: consult a doctor/medical service
- 4.4 After ingestion:**
- Immediately after ingestion: give lots of water to drink
  - Never give water to an unconscious person
  - Do not induce vomiting
  - Consult a doctor/medical service

## 5. Fire-fighting measures

- 5.1 Suitable extinguishing media:**
- Water
  - Water spray
  - Alcohol foam
  - BC powder
  - Carbon dioxide
- 5.2 Unsuitable extinguishing media:**
- No data available
- 5.3 Special exposure hazards:**
- Material presenting a fire hazard
  - On burning: CO and CO<sub>2</sub> are formed
- 5.4 Instructions:**
- Cool tanks/drums with water spray/remove them into safety
- 5.5 Special protective equipment for firefighters:**
- Heat/fire exposure: compressed air/oxygen apparatus
  - Heat/fire exposure: gas-tight suit

## 6. Accidental release measures

- 6.1 Personal protection/precautions:** see heading 8.1/8.3/10.3
- 6.2 Environmental precautions:**
- Contain leaking substance, pump over in suitable containers
  - Plug the leak, cut off the supply
- 6.3 Methods of cleaning up:**
- Take up liquid spill into absorbent material e.g.: sand/earth, vermiculite or kieselguhr
  - Absorbed substance: shovel in closing drums
  - Clean contaminated surfaces with an excess of water
  - Wash clothing and equipment after handling

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## 7. Handling and storage

### 7.1 Handling:

- Observe normal hygiene standards
- Use earthed equipment
- Remove contaminated clothing immediately
- Clean contaminated clothing

### 7.2 Storage:

- Keep container tightly closed
- Store in a dry area
- Store in a dark area
- Ventilation at floor level
- Keep away from: heat sources, oxidizing agents, acids, peroxides

Storage temperature	:	20	°C
Quantity limit	:	N.D.	kg
Storage life	:	N.D.	days
Materials for packaging	:		
- suitable	:	steel, aluminium, glass, polypropylene	
- to avoid	:	No data available	

### 7.3 Specific uses:

- See information supplied by the manufacturer

## 8. Exposure controls/Personal protection

### 8.1 Exposure limit values:

furfuryl alcohol

TLV-TWA	:	mg/m <sup>3</sup>	10	ppm
TLV-STEL	:	mg/m <sup>3</sup>	15	ppm
OES-LTEL	:	mg/m <sup>3</sup>	5	ppm
OES-STEL	:	mg/m <sup>3</sup>	15	ppm
MAK	:	mg/m <sup>3</sup>	10	ppm
MAC-TGG 8 h	:	mg/m <sup>3</sup>		
MAC-TGG 15 min.	:	mg/m <sup>3</sup>		
VME-8 h	:	mg/m <sup>3</sup>	10	ppm
VLE-15 min.	:	mg/m <sup>3</sup>	-	ppm
GWBB-8 h	:	mg/m <sup>3</sup>	10	ppm
GWK-15 min.	:	mg/m <sup>3</sup>	15	ppm
Momentary value	:	mg/m <sup>3</sup>		ppm
EC	:	mg/m <sup>3</sup>		ppm
EC-STEL	:	mg/m <sup>3</sup>		ppm

### Sampling methods:

- Furfuryl Alcohol
- Furfuryl Alcohol

NIOSH 2505  
OSHA CSI

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## 8.2 Exposure controls:

### 8.2.1 Occupational exposure controls:

- Measure the concentration in the air regularly
- Work under local exhaust/ventilation

### 8.2.2 Environmental exposure controls: see heading 13

## 8.3 Personal protection:

### 8.3.1 respiratory protection:

- High gas/vapour concentration: gas mask with filter type A

### 8.3.2 hand protection:

- Gloves  
suitable materials: Natural rubber  
Neoprene
- Breakthroughtime: N.D.

### 8.3.3 eye protection:

- Face shield

### 8.3.4 skin protection:

- Protective clothing  
suitable materials: Natural rubber  
Neoprene

## 9. Physical and chemical properties

### 9.1 General information:

Appearance (at 20°C)	: Liquid
Odour	: Mild and characteristic
Colour	: Colourless to Light-yellow

### 9.2 Important health, safety and environmental information:

pH value	: 4-6 (30 %)	
Boiling point/boiling range	: 170	°C
Flashpoint	: 83	°C
Explosion limits (at 72.5-122°C)	: 1.8/16.3	Vol%
Vapour pressure (at 20°C)	: 0.53	hPa
Vapour pressure (at 50°C)	: 4.5	hPa
Relative density (at 20°C)	: 1.13	
Water solubility	: complete	
Soluble in	: ethanol, ether, chloroform, methanol, 1-propanol, iso-amylalcohol, ethyl acetate	
Relative vapour density	: 3.4	
Viscosity (at 25°C)	: 0.0046	Pa.s
Partition coefficient n-octanol/water	: 0.28	
Evaporation rate		
ratio to butyl acetate	: N.D.	
ratio to ether	: 443	

### 9.3 Other information:

Melting point/melting range	: -29	°C
Auto-ignition point	: 390	°C
Saturation concentration	: 2.1	g/m <sup>3</sup>

# FURFURYL ALCOHOL

## 10. Stability and reactivity

### 10.1 Conditions to avoid/reactivity:

- Unstable on exposure to air
- Unstable on exposure to moisture
- Stable under normal conditions

### 10.2 Materials to avoid:

- Keep away from: heat sources, oxidizing agents, acids, peroxides

### 10.3 Hazardous decomposition products:

- Oxidizes slowly on exposure to air
- This reaction is accelerated on exposure to temperature rise
- Unstable in water
- On burning: CO and CO<sub>2</sub> are formed
- Polymerizes on exposure to. (strong) acids: heat release resulting in increased fire or explosion risk
- Violent to explosive reaction with (strong) oxidizers

## 11. Toxicological information

### 11.1 Acute toxicity:

furfuryl alcohol

LD50 oral rat	: 275	mg/kg
LD50 dermal rabbit	: N.D.	mg/kg
LD50 dermal rabbit	: 657	mg/kg
LC50 inhalation rat	: N.D.	mg/l/4 h
LC50 inhalation rat	: N.D.	ppm/4 h

### 11.2 Chronic toxicity:

Furfuryl alcohol

EC carc. cat.	: not listed
EC muta. cat.	: not listed
EC repr. cat.	: not listed

Carcinogenicity (TLV)	: not listed
Carcinogenicity (MAC)	: not listed
Carcinogenicity (VME)	: not listed
Carcinogenicity (GWBB)	: not listed

Carcinogenicity (MAK)	: not listed
Mutagenicity (MAK)	: not listed
Teratogenicity (MAK)	: not listed

IARC classification	: not listed
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Furfuryl alcohol does not possess genotoxic potential (in vivo).

An NTP study (1999) concluded that there was some evidence of carcinogenic activity of furfuryl alcohol in male rats and male mice.

### 11.3 Routes of exposure:

ingestion, inhalation, eye and skin  
Warning! Substance is absorbed through the skin

# FURFURYL ALCOHOL

## 11.4 Acute effects/symptoms:

### AFTER INHALATION

- Slight irritation
- Irritation of the nasal mucous membranes

### EXPOSURE TO HIGH CONCENTRATIONS:

- CNS depression
- Dizziness
- Coordination disorders

### AFTER INGESTION

#### AFTER ABSORPTION OF HIGH QUANTITIES:

- Rapid respiration
- Nausea
- Diarrhoea
- Dizziness
- Change in urine output
- Symptoms similar to those listed under inhalation

### AFTER SKIN CONTACT

- Slight irritation
- Dry skin

### AFTER EYE CONTACT

- Irritation of the eye tissue

#### ON CONTINUOUS EXPOSURE/CONTACT:

- Inflammation/damage of the eye tissue

## 11.5 Chronic effects:

- No cumulative effect
- Not listed in carcinogenicity class (IARC,EC,TLV,MAK)
- Not listed in mutagenicity class (EC,MAK)
- Not classified as toxic to reproduction (EC)

#### ON CONTINUOUS EXPOSURE/CONTACT:

- Red skin
- Dry skin

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## 12. Ecological information

### 12.1 Ecotoxicity:

#### Furfuryl alcohol:

- LC50 (96 h) : 32 mg/l (PIMEPHALES PROMELAS)
- EC50 (24 h) : 115 mg/l (DAPHNIA MAGNA)
- EC50 (24 h) : 100 mg/l (SCENEDESMUS QUADRICAUDA)

### 12.2 Mobility:

- Volatile organic compounds (VOC): 100%
- Soluble in water

For other physicochemical properties see section 9

### 12.3 Persistence and degradability:

- Biodegradation BOD<sub>5</sub> : 30 % ThOD
- Water : Readily biodegradable in water test: 75%, 14d., mitiI
- soil : T ½ N.D.

### 12.4 Bioaccumulative potential:

- log P<sub>ow</sub> : 0.28
- BCF : N.D.
- Slightly or not bioaccumulative

### 12.5 Other adverse effects:

- WGK : 1 (classification in compliance with Verwaltungsvorschrift wassergefährdender Stoffe (VwVwS) of 17 May 1999)
- Effect on the ozone layer : Not dangerous for the ozone layer (Council Regulation (EC) No 3093/94 , O.J. L333 of 22/12/94)
- Greenhouse effect : No data available
- Effect on waste water purification : No data available

## 13. Disposal considerations

### 13.1 Provisions relating to waste:

- Waste material code (91/689/EEC, Council Decision 2001/118/EC, O.J. L47 of 16/2/2001): 07 01 04 (other organic solvents, washing liquids and mother liquors )
- Waste material code (Flanders): 015; 034
- KCA ( the Netherlands): category 03
- Hazardous waste (91/689/EEC)

### 13.2 Disposal methods:

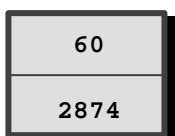
- Recycle by distillation
- Remove to an authorized waste incinerator for solvents
- Obtain the consent of pollution control authorities before discharging to wastewater treatment plants
- Do not discharge into surface water

### 13.3 Packaging:

- Waste material code packaging (91/689/EEC, Council Decision 2001/118/EC, O.J. L47 of 16/2/2001): 15 01 10 (packaging containing residues of or contaminated by dangerous substances)

# FURFURYL ALCOHOL

## 14. Transport information



- 14.1 Classification of the substance in compliance with UN Recommendations
- |                      |   |                           |
|----------------------|---|---------------------------|
| UN number            | : | 2874                      |
| CLASS                | : | 6.1                       |
| SUB RISKS            | : | -                         |
| PACKING              | : | III                       |
| PROPER SHIPPING NAME | : | UN 2874, Furfuryl alcohol |
- 14.2 ADR (transport by road)
- |                       |   |     |
|-----------------------|---|-----|
| CLASS                 | : | 6.1 |
| PACKING               | : | III |
| DANGER LABEL TANKS    | : | 6.1 |
| DANGER LABEL PACKAGES | : | 6.1 |
- 14.3 RID (transport by rail)
- |                       |   |     |
|-----------------------|---|-----|
| CLASS                 | : | 6.1 |
| PACKING               | : | III |
| DANGER LABEL TANKS    | : | 6.1 |
| DANGER LABEL PACKAGES | : | 6.1 |
- 14.4 ADNR (transport by inland waterways)
- |                       |   |     |
|-----------------------|---|-----|
| CLASS                 | : | 6.1 |
| PACKING               | : | III |
| DANGER LABEL TANKS    | : | 6.1 |
| DANGER LABEL PACKAGES | : | 6.1 |
- 14.5 IMDG (maritime transport)
- |                  |   |        |
|------------------|---|--------|
| CLASS            | : | 6.1    |
| SUB RISKS        | : | -      |
| PACKING          | : | III    |
| MFAG             | : | -      |
| EMS              | : | 6.1-02 |
| MARINE POLLUTANT | : | -      |
- 14.6 ICAO (air transport)
- |   |   |          |
|---|---|----------|
| CLASS                                   | : | 6.1      |
| SUB RISKS                               | : | -        |
| PACKING                                 | : | III      |
| PACKING INSTRUCTIONS PASSENGER AIRCRAFT | : | 611/Y611 |
| PACKING INSTRUCTIONS CARGO AIRCRAFT     | : | 618      |
- 14.7 Special precautions in connection with transport : None
- 14.8 Limited quantities (LQ) :

When substances and their packaging meet the conditions established by ADR/RID/ADNR in chapter 3.4, **only** the following prescriptions shall be complied with:  
each package shall display a diamond-shaped figure with the following inscription:  
- 'UN 2874'  
or, in the case of different goods with different identification numbers within a single package:  
- the letters 'LQ'

# FURFURYL ALCOHOL

## 15. Regulatory information

Labelling in compliance with Directives 67/548/EEC and 1999/45/EC



Harmful

- R20/21/22 : Harmful by inhalation, in contact with skin and if swallowed
- S(02) : (Keep out of reach of children)
- S26 : In case of contact with eyes, rinse immediately with plenty of water and seek medical advice

## 16. Other information

The information provided on this MSDS is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.

- N.A. = NOT APPLICABLE  
N.D. = NOT DETERMINED  
\* = INTERNAL CLASSIFICATION

Full text of any R-phrases referred to under heading 2:

- R20/21/22 : Harmful by inhalation, in contact with skin and if swallowed

### Exposure limits:

- TLV : Threshold Limit Value - ACGIH US 2002  
OES : Occupational Exposure Standards - United Kingdom 1999  
MEL : Maximum Exposure Limits - United Kingdom 1999  
MAK : Maximale Arbeitsplatzkonzentrationen - Germany 2001  
TRK : Technische Richtkonzentrationen - Germany 2001  
MAC : Maximale aanvaarde concentratie - the Netherlands 2002  
VME : Valeurs limites de Moyenne d'Exposition - France 1999  
VLE : Valeurs limites d'Exposition à court terme - France 1999  
GWBB : Grenswaarde beroepsmatige blootstelling - Belgium 2002  
GWK : Grenswaarde kortstondige blootstelling - Belgium 2002  
EC : Indicative occupational exposure limit values - directive 2000/39/EC

I : Inhalable fraction = T : Total dust = E : Einatembarer Aerosolanteil  
R : Respirable fraction = A : Alveolengängiger Aerosolanteil/Alveolar dust  
C : Ceiling limit

- |     |                  |       |                   |            |
|-----|------------------|-------|-------------------|------------|
| a:  | aerosol          | r:    | rook/Rauch        | (fume)     |
| d:  | damp (vapour)    | st:   | stof/Staub        | (dust)     |
| du: | dust             | ve:   | vezel             | (fibre)    |
| fa: | Faser (fibre)    | va:   | vapour            |            |
| fi: | fibre            | om:   | oil mist          |            |
| fu: | fume             | on:   | olienevel/Ölnebel | (oil mist) |
| p:  | poussière (dust) | part: | particles         |            |

### Chronic toxicity:

- K : List of the carcinogenic substances and processes - The Netherlands 2002