

Furfural

Tel: 905-685-8560 www.ifc-northamerica.com

1 . Product and company identification

Common name	: Furfural
Synonym	: 2-furancarboxaldehyde; fural; 2-furaldehyde; pyromucic aldehyde; artificial ant oil; 2-furalaldehyde; 2-furancarbal; furfuraldehyde; 2-furyl-methanal;
Material uses	: Fuel additive; Raw material in pharmaceutical industries and chemical synthesis; Impregnating agent; Solvent.
Supplier	: IFC NORTH AMERICA inc. 63 Church Street, Suite 403, St. Catharines, ON Canada L2R 3C4 Tel: 905.685.8560 Fax: 905.685.8712 E-mail: alex@ifc-northamerica.com
Manufacturer	: CENTRAL ROMANA CORPORATION, Ltd. La Romana, Dominican Republic Tel: 809.687.7787 Fax: 809.687.9740 Email: info@crcltd.com.do
In case of emergency	: CANUTEC (613) 996-6666 CHEMTREC, U.S. : (800) 424-9300 International: (703) 527-3887
MSDS authored by:	: Kemika XXI Inc. + 1-450-435-7475 12/01/2006

2 . Hazards identification

Physical state	: Liquid.
Odor	: Almond-like.
Color	: Colorless.
Hazard status	: This material is classified hazardous under OSHA regulations in the United States, the WHMIS Controlled Product Regulation in Canada and the NOM-018-STPS-2000 in Mexico.
Emergency overview	: DANGER! MAY BE FATAL IF SWALLOWED. CAUSES EYE AND SKIN IRRITATION. CAUSES DAMAGE TO THE FOLLOWING ORGANS: RESPIRATORY TRACT, SKIN, EYE, LENS OR CORNEA. FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE. Do not ingest. Avoid contact with skin and clothing. Keep away from heat, sparks and flame. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling.
Routes of entry	: Dermal contact. Eye contact. Inhalation. Ingestion.
Potential acute health effects	
Eyes	: Irritating to eyes.
Skin	: Irritating to skin.
Inhalation	: No known significant effects or critical hazards.
Ingestion	: Very toxic if swallowed.
Potential chronic health effects	: Carcinogenic effects Classified A3 (Proven for animals.) by ACGIH, 3 (Possible for humans.) by European Union. 3 (Not classifiable for humans.) by IARC. Mutagenic effects Not available. Teratogenic effects Not available.
Medical conditions aggravated by over-exposure	: Repeated skin exposure can produce local skin destruction or dermatitis. Repeated or prolonged contact with spray or mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to the substance can produce target organ damage.

See toxicological information (section 11)

Furfural

3. Composition/information on ingredients

United States

Name	CAS number	%
Furfural	98-01-1	70 - 100

Canada

Name	CAS number	%
Furfural	98-01-1	70 - 100

Mexico

Name	UN number	IDLH	Classification				CAS number	%
			H	F	R	Special		
Furfural	UN1199	100 ppm	3	2	0		98-01-1	70 - 100

4. First aid measures

- Eye contact** : Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 20 minutes. Get medical attention immediately.
- Skin contact** : In case of contact, immediately flush skin with plenty of water for at least 20 minutes. Get medical attention immediately.
- Inhalation** : If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
- Ingestion** : Do not induce vomiting. Never give anything by mouth to an unconscious person. Get medical attention immediately.
- Notes to physician** : No specific antidote. Medical staff must contact Poison Control Center.

5. Fire-fighting measures

- Flammability of the product** : Flammable.
- Products of combustion** : These products are carbon oxides.
- Extinguishing media**
- Suitable** : Use dry chemical, carbon dioxide, water spray (fog) or foam.
 - Not suitable** : Do not use water jet.
- Special exposure hazards** : Combustible liquid and vapor. Vapor may cause flash fire. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard.
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6. Accidental release measures

- Personal precautions** : Immediately contact emergency personnel. Eliminate all ignition sources. Keep unnecessary personnel away. Use suitable protective equipment. Do not touch or walk through spilled material.
- Environmental precautions** : Avoid dispersal of spilled material, runoff and contact with soil, waterways, drains and sewers.
- Methods for cleaning up** : If emergency personnel are unavailable, contain spilled material. For small spills, add absorbent (soil may be used in the absence of other suitable materials) and use a non-sparking or explosion-proof means to transfer material to a sealable, appropriate container for disposal. For large spills, dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Place spilled material in an appropriate container for disposal.

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7. Handling and storage

- Handling** : Do not ingest. Avoid contact with eyes, skin and clothing. Keep container closed. Use only with adequate ventilation. Keep away from heat, sparks and flame. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Use explosion-proof electrical (ventilating, lighting and material handling) equipment.
- Storage** : Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

8. Exposure controls/personal protection

United States

Product name

Furfural

Exposure limits

ACGIH TLV (United States, 1/2005). Skin

TWA: 7,9 mg/m³ 8 hour(s).

TWA: 2 ppm 8 hour(s).

OSHA PEL (United States, 8/1997). Skin

TWA: 20 mg/m³ 8 hour(s).

TWA: 5 ppm 8 hour(s).

Canada

Product name

Furfural

Exposure limits

ACGIH TLV (United States, 1/2005). Skin

TWA: 7,9 mg/m³ 8 hour(s).

TWA: 2 ppm 8 hour(s).

Mexico

Product name

Furfural

Exposure limits

NOM-010-STPS (Mexico, 9/2000). Skin

CCT: 40 mg/m³ 15 minute(s).

CCT: 10 ppm 15 minute(s).

CPT: 8 mg/m³ 8 hour(s).

CPT: 2 ppm 8 hour(s).

- Engineering measures** : Use only with adequate ventilation. If user operations generate dust, fumes, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limit. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Personal protection

Eyes

- : Splash goggles.

Skin

- : Lab coat.

Respiratory

- : Vapor respirator.

Hands

- : Natural rubber (latex).



HMIS Code/Personal protective equipment

- : G

Personal protection in case of a large spill : Safety glasses, goggles or face shield. Impervious gloves. Full suit. Boots. Wear NIOSH-approved self-contained breathing apparatus or equivalent and full protective gear.

Hygiene measures : Wash hands, forearms and face thoroughly after handling compounds and before eating, smoking and using the lavatory and at the end of the day. Follow good industrial hygiene practice.

9 . Physical and chemical properties

Physical state	: Liquid.
Flash point	: Open cup: 59.85°C (139.7°F) (Cleveland.)
Auto-ignition temperature	: 315.41°C (599.7°F)
Color	: Colorless.
Odor	: Almond-like.
Molecular weight	: 96.09 g/mole
Molecular formula	: C ₅ H ₄ O ₂
Boiling/condensation point	: 161.85°C (323.3°F)
Melting/freezing point	: -36.15°C (-33.1°F)
Critical temperature	: 396.9°C (746.4°F)
Relative density	: 1.16 (Water = 1)
Vapor density	: 3.31 (Air = 1)
Evaporation rate	: 0.1

10 . Stability and reactivity

Stability and reactivity	: The product is stable.
Incompatibility with various substances	: Reactive with oxidizing materials.
Hazardous polymerization	: Will not occur.
Conditions of reactivity	: Flammable in the presence of the following materials or conditions: open flames, sparks and static discharge. Slightly flammable in the presence of the following materials or conditions: heat.

11 . Toxicological information

Product/ingredient name	Toxicity data			Species
	Test	Result	Route	
Furfural	LD50	65 mg/kg	Oral	Rat
	LD50	400 mg/kg	Oral	Mouse
	LD50	541 mg/kg	Oral	Guinea pig

IDLH	: 100 ppm
Acute Effects	
Eyes	: Irritating to eyes.
Skin	: Irritating to skin.
Inhalation	: No known significant effects or critical hazards.
Ingestion	: Very toxic if swallowed.
Potential chronic health effects	: Carcinogenic effects Classified A3 (Proven for animals.) by ACGIH, 3 (Possible for humans.) by European Union. 3 (Not classifiable for humans.) by IARC. Mutagenic effects Not available. Teratogenic effects Not available.
Target organs	: Causes damage to the following organs: upper respiratory tract, skin, eye, lens or cornea.

12 . Ecological information

Product/ingredient name	Ecotoxicity data		
	Species	Period	Result
Furfural	Pimephales promelas (LC50)	96 hour(s)	32 mg/l

Environmental precautions	: No known significant effects or critical hazards.
Products of degradation	: These products are carbon oxides and water.
Toxicity of the products of biodegradation	: The products of degradation are less toxic than the product itself.







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13 . Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Avoid dispersal of spilled material, runoff and contact with soil, waterways, drains and sewers. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional and local authority requirements.

14 . Transport information

NAERG : 132P

Regulatory information	Proper shipping name	Class	UN number	PG	Label
UN / IMDG / IATA Classification	FURALDEHYDES	6.1, (3)	UN1199	II	 
DOT Classification	FURALDEHYDES	6.1, (3)	UN1199	II	 
TDG Classification	FURALDEHYDES	6.1, (3)	UN1199	II	 
Additional information	UN	IMDG	IATA	DOT	TDG
	-	-	-	Reportable quantity 5000 lbs. (2268 kg)	-

15 . Regulatory information

United States

HCS Classification : Combustible liquid
Highly toxic material
Irritating material

U.S. Federal regulations : TSCA 8(a) PAIR: 2-Furaldehyde
TSCA 8(b) inventory: 2-Furaldehyde
SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: 2-Furaldehyde
SARA 311/312 MSDS distribution - chemical inventory - hazard identification:
2-Furaldehyde: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard
Clean Water Act (CWA) 307: No products were found.
Clean Water Act (CWA) 311: 2-Furaldehyde
Clean Air Act (CAA) 112 accidental release prevention: No products were found.
Clean Air Act (CAA) 112 regulated flammable substances: No products were found.
Clean Air Act (CAA) 112 regulated toxic substances: No products were found.

State regulations : Pennsylvania RTK: 2-Furaldehyde: (environmental hazard, generic environmental hazard)
Massachusetts RTK: 2-Furaldehyde
New Jersey: 2-Furaldehyde

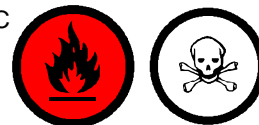
Furfural

California prop. 65: No products were found.

Canada

WHMIS (Canada)

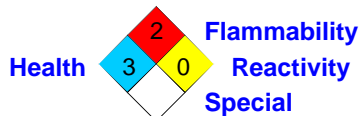
- : Class B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F).
- Class D-1B: Material causing immediate and serious toxic effects (Toxic).
- Class D-2B: Material causing other toxic effects (Toxic).
- CEPA DSL: 2-Furaldehyde



This product has been classified in accordance with the hazard criteria of the Canadian CPR, the United States OSHA and the Mexican NOM -018-STPS-2000. This MSDS contains all the information required by the CPR, OSHA, the American National Standard Institute (ANSI) Z400.1 and NOM -018-STPS-2000.

Mexico

Classification



HAZARD RATINGS

- 4- Extreme
- 3- Serious
- 2- Moderate
- 1- Slight
- 0- Minimal

International regulations

International lists

- : This product, (and its ingredients) is (are) listed on national inventories, or is (are) exempted from being listed, in Australia (AICS), in Europe (EINECS/ELINCS), in Korea (TCCL), in Japan (METI), in the Philippines (RA6969).

16 . Other information

- Label requirements (U.S.A.)** : MAY BE FATAL IF SWALLOWED.
CAUSES EYE AND SKIN IRRITATION.
CAUSES DAMAGE TO THE FOLLOWING ORGANS: RESPIRATORY TRACT, SKIN, EYE, LENS OR CORNEA.
FLAMMABLE LIQUID AND VAPOR.
VAPOR MAY CAUSE FLASH FIRE.

Hazardous Material Information System (U.S.A.)

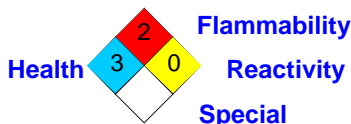
HMIS RATING

Health	*	3
Fire hazard		2
Physical Hazard		0
Personal protection		G

HAZARD RATINGS

- 4- Extreme
 - 3- Serious
 - 2- Moderate
 - 1- Slight
 - 0- Minimal
- See section 8 for more detailed information on personal protection.

National Fire Protection Association (U.S.A.)



References

- : ANSI Z400.1, MSDS Standard, 2004. - Manufacturer's Material Safety Data Sheet. - 29CFR Part1910.1200 OSHA MSDS Requirements. - 49CFR Table List of Hazardous Materials, UN#, Proper Shipping Names, PG. - Canada Gazette Part II, Vol. 122, No. 2. Registration SOR/88-64, 31 December 1987. Hazardous Products Act "Ingredient Disclosure List" - Canadian Transport of Dangerous Goods, Regulations and Schedules, Clear Language version 2005. - Official Mexican Standards NOM-018-STPS-2000 and NOM-004-SCT2-1994.

- Date of issue** : 12/01/2006
- Date of previous issue** : 01/31/2005
- Version** : 2

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.