

## Material Safety Data Sheet

### Furfural

#### Section 1: Chemical Product and Company Identification

Product Name : Furfural  
Chemical Name : 2-Furancarboxyaldehyde  
Chemical Formula : C<sub>5</sub>-H<sub>4</sub>-O<sub>2</sub>  
Company Identification : Tradeasia International Pte Limited  
Address : 133 Cecil Street # 12-03 Keck Seng Tower, Singapore  
Tel:+65-6227 6365  
Fax:+65-6225 6286  
Email: [contact@chemtradeasia.com](mailto:contact@chemtradeasia.com)

#### Section 2: Composition and Information on Ingredients

##### Composition:

Name	CAS #	% by Weight
{2-}Furancarboxyaldehyde	98-01-1	100

#### Section 3: Hazards Identification

##### Potential Acute Health Effects:

Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation (lung irritant). Slightly hazardous in case of skin contact (permeator). Severe over-exposure can result in death.

##### Potential Chronic Health Effects:

Slightly hazardous in case of skin contact (sensitizer). CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH. 3 (Not classifiable for human.) by IARC. MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Classified Reproductive system/toxin/male [POSSIBLE]. The substance may be toxic to kidneys, the nervous system, liver, upper respiratory tract, skin, eyes. Repeated or prolonged exposure to the substance can produce target organs

damage. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

#### Section 4: First Aid Measures

##### **Eye Contact:**

Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Get medical attention.

##### **Skin Contact:**

In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

##### **Serious Skin Contact:**

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

##### **Inhalation:**

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

##### **Serious Inhalation:**

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. **WARNING:** It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

##### **Ingestion:**

If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

**Serious Ingestion:** Not available.

#### Section 5: Fire and Explosion Data

**Flammability of the Product:** Flammable.

**Auto-Ignition Temperature:** 392°C (737.6°F)

**Flash Points:** CLOSED CUP: 60°C (140°F). OPEN CUP: 68°C (154.4°F) (Cleveland).

**Flammable Limits:** LOWER: 2.1% UPPER: 19.3%

**Products of Combustion:** These products are carbon oxides (CO, CO<sub>2</sub>).

**Fire Hazards in Presence of Various Substances:** Flammable in presence of open flames and sparks, of heat.

**Explosion Hazards in Presence of Various Substances:**

Risks of explosion of the product in presence of mechanical impact: Not available. Explosive in presence of open flames and sparks, of heat.

**Fire Fighting Media and Instructions:**

Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

**Special Remarks on Fire Hazards:**

When heated to decomposition it emits acrid smoke and irritating fumes. Vapor forms flammable mixture with air. Vapor may travel considerable distance to source of ignition and flash back. Spontaneous occurs when furfural is mixed with sodium hydrogen carbonate.

**Special Remarks on Explosion Hazards:** Not available.

## Section 6: Accidental Release Measures

**Small Spill:**

Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

**Large Spill:**

Flammable liquid. Poisonous liquid. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

## Section 7: Handling and Storage

### Precautions:

Keep locked up.. Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, acids, alkalis.

### 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). Do not store below 8°C (46.4°F).

## Section 8: Exposure Controls/Personal Protection

### Engineering Controls:

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

### Personal Protection:

Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

### Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

### Exposure Limits:

TWA: 5 (ppm) from OSHA (PEL) [United States] TWA: 2 (ppm) from ACGIH (TLV) [United States]  
TWA: 7.9 (mg/m<sup>3</sup>) from ACGIH (TLV) [United States] TWA: 5 (ppm) TWA: 20 (mg/m<sup>3</sup>) from OSHA (PEL) [United States] Consult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

Physical state and appearance	: Liquid. (Liquid.)
Odor	: Almond-like. (Strong.)
Taste	: distinct caramel
Molecular Weight	: 96.09 g/mole
Color	: Colorless. Amber.
pH (1% soln/water)	: Not available.
Boiling Point	: 161.8°C (323.2°F)
Melting Point	: -38.7°C (-37.7°F)
Critical Temperature	: 397°C (746.6°F)
Specific Gravity	: 1.1598 (Water = 1)
Vapor Pressure	: 0.3 kPa (@ 20°C)
Vapor Density	: 3.3 (Air = 1)
Volatility	: Not available.
Odor Threshold	: 0.078 - 0.4 ppm
Water/Oil Dist. Coeff.	: The product is more soluble in oil; log(oil/water) = 0.4
Ionicity (in Water)	: Not available.
Dispersion Properties	: See solubility in water, diethyl ether, acetone.
Solubility	:
Soluble in cold water, hot water, diethyl ether, acetone. Soluble in chloroform, petroleum ether, benzene, and ethanol	

## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Excess heat, ignition sources, incompatible materials

**Incompatibility with various substances:** Reactive with oxidizing agents, acids, alkalis.

**Corrosivity:** Non-corrosive in presence of glass.

**Special Remarks on Reactivity:**

Light sensitive. Furfural may undergo a violent reaction when in the presence of strong mineral acids, alkalies, or oxidizing materials. It is also incompatible with ammonia, aliphatic amines, and aromatic

amines.. Many coatings and plastics are attacked by furfural. This material may spontaneously polymerize under certain conditions. Polymerization reactions are usually exothermic (heat releasing). Once initiated, it cannot be stopped until it reaches completion.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:**

Yes. This material may spontaneously polymerize under certain conditions. Polymerization reactions are usually exothermic (heat releasing). Once initiated, it cannot be stopped until it reaches completion.

## Section 11: Toxicological Information

**Routes of Entry:** Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

**Toxicity to Animals:**

**Acute oral toxicity (LD50):** 65 mg/kg [Rat.]. Acute toxicity of the vapor (LC50): 175 ppm 6 hours [Rat.].

**Chronic Effects on Humans:**

**CARCINOGENIC EFFECTS:** Classified A3 (Proven for animal.) by ACGIH. 3 (Not classifiable for human.) by IARC. **MUTAGENIC EFFECTS:** Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. **DEVELOPMENTAL TOXICITY:** Classified Reproductive system/toxin/male [POSSIBLE]. May cause damage to the following organs: kidneys, the nervous system, liver, upper respiratory tract, skin, eyes.

**Other Toxic Effects on Humans:**

Hazardous in case of skin contact (irritant), of ingestion, of inhalation (lung irritant). Slightly hazardous in case of skin contact (permeator).

**Special Remarks on Toxicity to Animals:** Not available.

**Special Remarks on Chronic Effects on Humans:**

May affect genetic material. May cause adverse reproductive effects (fetotoxicity and paternal effects) based on animal data. May cause cancer (tumorigenic) based on animal data.

**Special Remarks on other Toxic Effects on Humans:**

**Acute Potential Health Effects:** Skin: Causes skin irritation. Absorption may occur through intact skin. Eyes: Causes eye irritation. Inhalation: Vapor is irritating to mucous membranes and upper respiratory tract and may affect behavior/central nervous system. Symptoms may include sore throat,

and may cause headaches, dizziness, labored breathing, shortness of breath, and pulmonary congestion. May also affect metabolism. Ingestion: Harmful if swallowed. May cause gastrointestinal tract irritation with sore throat, abdominal pain, nausea, and vomiting, and diarrhea. It may also affect behavior/Central Nervous system (seizures, convulsions, ataxia, central nervous system depression, headache, fatigue, tremor), respiration (respiratory stimulation), liver, blood, urinary system, peripheral nervous system, and may cause tongue numbness, loss of taste sense, and throat itching. Chronic Potential Health Effects: Skin: Repeated or prolonged exposure may dermal sensitization, eczema, and allergic contact dermatitis.

## Section 12: Ecological Information

**Ecotoxicity:** Ecotoxicity in water (LC50): 37.1 ppm 96 hours [Trout].

**BOD5 and COD:** Not available.

### **Products of Biodegradation:**

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are less toxic than the product itself.

**Special Remarks on the Products of Biodegradation:** Not available.

## Section 13: Disposal Considerations

### **Waste Disposal:**

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

## Section 14: Transport Information

**DOT Classification:** CLASS 6.1: Poisonous material.

**Identification:** : Furaldehyde UNNA: 1199 PG: II

**Special Provisions for Transport:** Not available.

## Section 15: Other Regulatory Information

### **Federal and State Regulations:**

Illinois toxic substances disclosure to employee act: 2-Furancarboxyaldehyde Illinois chemical safety act: 2- Furancarboxyaldehyde New York release reporting list: 2-Furancarboxyaldehyde Rhode Island RTK hazardous substances: 2-Furancarboxyaldehyde Pennsylvania RTK: 2-Furancarboxyaldehyde Minnesota: 2-Furancarboxyaldehyde Massachusetts RTK: 2-Furancarboxyaldehyde Massachusetts spill list: 2-Furancarboxyaldehyde New Jersey: 2-Furancarboxyaldehyde New Jersey spill list: 2-Furancarboxyaldehyde Louisiana spill reporting: 2-Furancarboxyaldehyde California Director's List of Hazardous Substances: 2-Furancarboxyaldehyde TSCA 8(b) inventory: 2-Furancarboxyaldehyde TSCA 8(a) PAIR: 2-Furancarboxyaldehyde TSCA 8(d) H and S data reporting: 2-Furancarboxyaldehyde: Effective Date: 6/1/87; Sunset date: 6/1/01 CERCLA: Hazardous substances.: 2-Furancarboxyaldehyde: 5000 lbs. (2268 kg)

**Other Regulations:**

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

**Other Classifications:**

**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).

**DSCL (EEC):**

R21- Harmful in contact with skin. R23/25- Toxic by inhalation and if swallowed. R36/37- Irritating to eyes and respiratory system. R40- Possible risks of irreversible effects. S1/2- Keep locked up and out of the reach of children. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S36/37/39- Wear suitable protective clothing, gloves and eye/face protection. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

**HMIS (U.S.A.):**

**Health Hazard: 3**

**Fire Hazard: 2**

**Reactivity: 0**

**Personal Protection: h**

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



**Health: 3**

**Flammability: 2**

**Reactivity: 0**

**Specific hazard:**

**Protective Equipment:**

Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

## Section 16: Other Information

### References:

-Hawley, G.G..The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987. -Material safety data sheet emitted by: la Commission de la Santé et de la Sécurité du Travail du Québec. -SAX, N.I. Dangerous Properties of Industrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984. -The Sigma-Aldrich Library of Chemical Safety Data, Edition II. -Guide de la loi et du règlement sur le transport des marchandises dangereuses au Canada. Centre de conformité international Ltée. 1986.

**Other Special Considerations:** Not available.

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