FURAN

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CAUTIONARY RESPONSE INFORMATION

Common Synonyms	Liquid	Colorless	Mild, pleasant
Divinylene oxide Furfuran Oxacyclopentadiene Oxole Tetrole	Floats and very slowly mixes with water.		

AVOID CONTACT WITH LIQUID AND VAPOR. KEEP PEOPLE AWAY.
Avoid inhalation.
Wear self-contained positive pressure breathing apparatus and full protective clothing.
Shut off ignition sources. Call fire department.
Stay upwind and use water spray to ``knock down'' vapors.
Notify local health and pollution control agencies.
Protect water intakes.

Fire

FLAMMABLE
Flashback along vapor trail may occur.
Containers may explode in fire.
Vapor may explode if ignited in an enclosed area.
Wear self-contained positive pressure breathing apparatus and full protective clothing.
Extinguish small fires: dry chemicals, CO_2, water spray, or alcohol foam; large fires: water spray, fog or alcohol foam.
Combat fires from safe distance or protected location (behind barriers) with unmanned monitor nozzle.
Cool exposed containers with water.

Exposure

CALL FOR MEDICAL HELP.

VAPOR
May be harmful if inhaled.
Narcotic; may cause dizziness or suffocation.
Move victim to fresh air.
If not breathing, give artificial respiration.
If breathing is difficult, give oxygen.

LIQUID
May be harmful if swallowed or absorbed through skin.
Contact may irritate or burn skin and eyes.
IF IN EYES OR ON SKIN immediately flush with running water for at least 15 min.; hold eyelids open if necessary.
Remove and isolate contaminated clothing and shoes at the site.
If SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim warm.

Water Pollution

Effect of low concentrations on aquatic life is unknown.
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. CORRECTIVE RESPONSE ACTIONS

Stop discharge
Dilute and disperse

2. CHEMICAL DESIGNATIONS

2.1 CG Compatibility Group: Not listed.
2.2 Formula: C_4H_4O
2.3 IMO/UN Designation: 3.1/2389
2.4 DOT ID No.: 2389
2.5 CAS Registry No.: 110-00-9
2.6 NAERG Guide No.: 127
2.7 Standard Industrial Trade Classification: 51569

3. HEALTH HAZARDS

3.1 Personal Protective Equipment: Wear self-contained positive pressure breathing apparatus and full protective clothing.
3.2 Symptoms Following Exposure: May be harmful if inhaled, swallowed or absorbed through skin. Narcotic; may cause dizziness or suffocation. Contact may irritate or burn skin and eyes.
3.3 Treatment of Exposure: INHALATION: Move victim to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. EYES OR SKIN: Flush with running water for at least 15 min.; hold eyelids open if necessary. Wash skin with soap and water. Remove and isolate contaminated clothing and shoes at the site. INGESTION: If victim is unconscious or having convulsions, do nothing except keep victim warm.
3.4 TLV-TWA: Not listed.
3.5 TLV-STEL: Not listed.
3.6 TLV-Ceiling: Not listed.
3.7 Toxicity by Ingestion: Currently not available
3.8 Toxicity by Inhalation: Currently not available.
3.9 Chronic Toxicity: May cause mutagenic effects.
3.10 Vapor (Gas) Irritant Characteristics: Currently not available
3.11 Liquid or Solid Characteristics: Currently not available
3.12 Odor Threshold: Currently not available
3.13 IDLH Value: Not listed.
3.14 OSHA PEL-TWA: Not listed.
3.15 OSHA PEL-STEL: Not listed.
3.16 OSHA PEL-Ceiling: Not listed.
3.17 EPA AEGL: Not listed

4. FIRE HAZARDS

4.1 Flash Point: -40°F.O.C.; -58°F.C.C.
4.2 Flammable Limits in Air: 2.3% - 14.3%
4.3 Fire Extinguishing Agents: Small fires: dry chemical, CO_2, water spray or alcohol foam; large fires: water spray, fog or alcohol foam. (Water may be ineffective.)
4.4 Fire Extinguishing Agents Not to Be Used: Not pertinent
4.5 Special Hazards of Combustion Products: Currently not available
4.6 Behavior in Fire: Vapors may travel to a source of ignition and flash back. Container may explode in heat of fire. Vapor explosion hazard exists indoors, outdoors or in sewers.
4.7 Auto Ignition Temperature: Currently not available
4.8 Electrical Hazards: Currently not available
4.9 Burning Rate: Currently not available
4.10 Adiabatic Flame Temperature: Currently not available
4.11 Stoichometric Air to Fuel Ratio: 21.4 (calc.)
4.12 Flame Temperature: Currently not available
4.13 Combustion Molar Ratio (Reactant to Product): 6.0 (calc.)
4.14 Minimum Oxygen Concentration for Combustion (MOCC): Not listed

5. CHEMICAL REACTIVITY

5.1 Reactivity with Water: No reaction
5.2 Reactivity with Common Materials: Currently not available
5.3 Stability During Transport: Stable
5.4 Neutralizing Agents for Acids and Caustics: Not pertinent
5.5 Polymerization: Not pertinent
5.6 Inhibitor of Polymerization: Not pertinent

6. WATER POLLUTION

6.1 Aquatic Toxicity: Currently not available
6.2 Waterfowl Toxicity: Currently not available
6.3 Biological Oxygen Demand (BOD): Currently not available
6.4 Food Chain Concentration Potential: Currently not available
6.5 GESAMP Hazard Profile:
Bioaccumulation: 0
Damage to living resources: 2
Human Oral hazard: 1
Human Contact hazard: -
Reduction of amenities: -

7. SHIPPING INFORMATION

7.1 Grades of Purity: 99+% (Stabilized with 0.0254% 2,6-di-tert-butyl-4-Methylphenol to prevent formation of peroxide).
7.2 Storage Temperature: Keep cool
7.3 Inert Atmosphere: Currently not available
7.4 Venting: Not pertinent
7.5 IMO Pollution Category: Currently not available
7.6 Ship Type: Currently not available
7.7 Barge Hull Type: Currently not available

8. HAZARD CLASSIFICATIONS

8.1 49 CFR Category: Flammable liquid
8.2 49 CFR Class: 3
8.3 49 CFR Package Group: I
8.4 Marine Pollutant: No
8.5 NFPA Hazard Classification:

Category	Classification
Health Hazard (Blue).....	1
Flammability (Red).....	4
Instability (Yellow).....	1

8.6 EPA Reportable Quantity: 100 pounds
8.7 EPA Pollution Category: B
8.8 RCRA Waste Number: U124
8.9 EPA FWPCA List: Not listed

9. PHYSICAL & CHEMICAL PROPERTIES

9.1 Physical State at 15° C and 1 atm: Liquid
9.2 Molecular Weight: 68.08
9.3 Boiling Point at 1 atm: 88.3°F. = 31.3°C. = 304°K.
9.4 Freezing Point: -122.2°F = -85.68°C. = 187.5°K.
9.5 Critical Temperature: 416.8°F. = 213.8°C. = 487.0°K.
9.6 Critical Pressure: 772 psia = 52.5 atm = 5.32 MN/m^2
9.7 Specific Gravity: .9514 at 20°C.
9.8 Liquid Surface Tension: 24.10 dynes/cm = 0.0241 N/m at 20°C.
9.9 Liquid Water Interfacial Tension: Currently not available
9.10 Vapor (Gas) Specific Gravity: 2.3 (est.)
9.11 Ratio of Specific Heats of Vapor (Gas): Currently not available
9.12 Latent Heat of Vaporization: 171.2 Btu/lb = 95.09 cal/g = 3.981 X 10^5 J/kg
9.13 Heat of Combustion: -12,599 Btu/lb = -7,000 cal/g = -293 X 10^5 J/kg
9.14 Heat of Decomposition: Not pertinent
9.15 Heat of Solution: Currently not available
9.16 Heat of Polymerization: Not pertinent
9.17 Heat of Fusion: Currently not available
9.18 Limiting Value: Currently not available
9.19 Reid Vapor Pressure: Currently not available

NOTES

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9.20 SATURATED LIQUID DENSITY		9.21 LIQUID HEAT CAPACITY		9.22 LIQUID THERMAL CONDUCTIVITY		9.23 LIQUID VISCOSITY	
Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F	Temperature (degrees F)	British thermal unit inch per hour-square foot-F	Temperature (degrees F)	Centipoise
68	59.400		CURRENTLY NOT AVAILABLE		CURRENTLY NOT AVAILABLE	68	0.380

9.24 SOLUBILITY IN WATER		9.25 SATURATED VAPOR PRESSURE		9.26 SATURATED VAPOR DENSITY		9.27 IDEAL GAS HEAT CAPACITY	
Temperature (degrees F)	Pounds per 100 pounds of water	Temperature (degrees F)	Pounds per square inch	Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F
77	1.000	10	1.012	10	0.01298	100	0.234
		20	2.129	20	0.02710	125	0.252
		30	3.367	30	0.04249	150	0.268
		40	4.747	40	0.05936	175	0.282
		50	6.296	50	0.07791	200	0.295
		60	8.047	60	0.09842	225	0.307
		70	10.041	70	0.12122	250	0.318
		80	12.334	80	0.14670	275	0.328
						300	0.338
						325	0.347
						350	0.355
						375	0.364
						400	0.372