

PROPANE

PRP

CAUTIONARY RESPONSE INFORMATION

Common Synonyms Dimethylmethane	Liquefied flammable gas Colorless Odorless-may have skunk odor added Liquid floats and boils on water. Flammable visible vapor cloud is produced.
<p>Evacuate. Keep people away. Avoid contact with liquid and gas. Avoid inhalation. Shut off ignition sources and call fire department. Stay upwind and use water spray to "knock down" vapor. Notify local health and pollution control agencies.</p>	
Fire	<p>FLAMMABLE. Containers may explode in fire. Flashback along vapor trail may occur. Vapor may explode if ignited in an enclosed area. Stop flow of gas if possible. Cool exposed containers and protect men effecting shut-off with water. Let fire burn.</p>
Exposure	<p>CALL FOR MEDICAL AID.</p> <p>VAPOR Not irritating to eyes, nose or throat. If inhaled, will cause dizziness, difficult breathing, or loss of consciousness. Move to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen.</p> <p>LIQUID May cause frostbite. Flush affected areas with plenty of water. DO NOT RUB AFFECTED AREAS.</p>
Water Pollution	Not harmful to aquatic life.

1. CORRECTIVE RESPONSE ACTIONS

Stop discharge
Chemical and Physical Treatment: Burn

2. CHEMICAL DESIGNATIONS

- 2.1 CG Compatibility Group: 31; Paraffin
- 2.2 Formula: CH₃CH₂CH₃
- 2.3 IMO/UN Designation: 2.0/1978
- 2.4 DOT ID No.: 1978
- 2.5 CAS Registry No.: 74-98-6
- 2.6 NAERG Guide No.: 115
- 2.7 Standard Industrial Trade Classification: 51114

3. HEALTH HAZARDS

- 3.1 **Personal Protective Equipment:** Self-contained breathing apparatus for high concentrations of gas.
- 3.2 **Symptoms Following Exposure:** Vaporizing liquid may cause frostbite. Concentrations in air greater than 10% cause dizziness in a few minutes. 1% concentrations give the same effect in 10 min. High concentrations cause asphyxiation.
- 3.3 **Treatment of Exposure:** Remove to open air. If victim is overcome by gas, apply artificial respiration. Guard against self-injury if confused.
- 3.4 **TLV-TWA:** Not listed.
- 3.5 **TLV-STEL:** Not listed.
- 3.6 **TLV-Ceiling:** Not listed.
- 3.7 **Toxicity by Ingestion:** Not pertinent
- 3.8 **Toxicity by Inhalation:** Currently not available.
- 3.9 **Chronic Toxicity:** None
- 3.10 **Vapor (Gas) Irritant Characteristics:** Vapors are nonirritating to the eyes and throat.
- 3.11 **Liquid or Solid Characteristics:** No appreciable hazard. Practically harmless to the skin because it evaporates quickly.
- 3.12 **Odor Threshold:** 5,000-20,000 ppm
- 3.13 **IDLH Value:** 2,100 ppm
- 3.14 **OSHA PEL-TWA:** 1,000 ppm
- 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:**
-156°F C.C. (gas)
- 4.2 **Flammable Limits in Air:** 2.1%-9.5%
- 4.3 **Fire Extinguishing Agents:** Stop flow of gas. For small fires use dry chemicals. Cool adjacent areas with water spray.
- 4.4 **Fire Extinguishing Agents Not to Be Used:** Water
- 4.5 **Special Hazards of Combustion Products:** Not pertinent
- 4.6 **Behavior in Fire:** Containers may explode. Vapor is heavier than air and may travel a long distance to a source of ignition and flash back.
- 4.7 **Auto Ignition Temperature:** 842°F
- 4.8 **Electrical Hazards:** Class I, Group D
- 4.9 **Burning Rate:** 8.2 mm/min.
- 4.10 **Adiabatic Flame Temperature:** 2419. (Est.)
- 4.11 **Stoichiometric Air to Fuel Ratio:** 23.8 (calc.)
- 4.12 **Flame Temperature:** Currently not available
- 4.13 **Combustion Molar Ratio (Reactant to Product):** 7.0 (calc.)
- 4.14 **Minimum Oxygen Concentration for Combustion (MOCC):** N₂ diluent: 11.4-11.5%; CO₂ diluent: 14.5%

5. CHEMICAL REACTIVITY

- 5.1 **Reactivity with Water:** No reaction
- 5.2 **Reactivity with Common Materials:** No reaction
- 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:**
None
- 6.2 **Waterfowl Toxicity:** None
- 6.3 **Biological Oxygen Demand (BOD):** None
- 6.4 **Food Chain Concentration Potential:** None
- 6.5 **GESAMP Hazard Profile:** Not listed

7. SHIPPING INFORMATION

- 7.1 **Grades of Purity:** Research; instrument, or Pure: 99.35+ % Technical: 97.50 %
- 7.2 **Storage Temperature:** Ambient
- 7.3 **Inert Atmosphere:** No requirement
- 7.4 **Venting:** Safety relief
- 7.5 **IMO Pollution Category:** Currently not available
- 7.6 **Ship Type:** 2
- 7.7 **Barge Hull Type:** Currently not available

8. HAZARD CLASSIFICATIONS

- 8.1 **49 CFR Category:** Flammable gas
- 8.2 **49 CFR Class:** 2.1
- 8.3 **49 CFR Package Group:** Not pertinent.
- 8.4 **Marine Pollutant:** No
- 8.5 **NFPA Hazard Classification:**

Category	Classification
Health Hazard (Blue).....	1
Flammability (Red).....	4
Instability (Yellow).....	0
- 8.6 **EPA Reportable Quantity:** Not listed.
- 8.7 **EPA Pollution Category:** Not listed.
- 8.8 **RCRA Waste Number:** Not listed
- 8.9 **EPA FWPCA List:** Not listed

9. PHYSICAL & CHEMICAL PROPERTIES

- 9.1 **Physical State at 15° C and 1 atm:** Gas
- 9.2 **Molecular Weight:** 44.09
- 9.3 **Boiling Point at 1 atm:** -43.8°F = -42.1°C = 231.1°K
- 9.4 **Freezing Point:** -305.9°F = -187.7°C = 85.5°K
- 9.5 **Critical Temperature:** 206.0°F = 96.67°C = 369.87°K
- 9.6 **Critical Pressure:** 616.5 psia = 41.94 atm = 4.249 MN/m²
- 9.7 **Specific Gravity:** 0.590 at -50°C (liquid)
- 9.8 **Liquid Surface Tension:** 16 dynes/cm = 0.016 N/m at -47°C
- 9.9 **Liquid Water Interfacial Tension:** (est.) 50 dynes/cm = 0.05 N/m at -50°C
- 9.10 **Vapor (Gas) Specific Gravity:** 1.5
- 9.11 **Ratio of Specific Heats of Vapor (Gas):** 1.130
- 9.12 **Latent Heat of Vaporization:** 183.2 Btu/lb = 101.8 cal/g = 4.262 X 10⁵ J/kg
- 9.13 **Heat of Combustion:** -19,782 Btu/lb = -10,990 cal/g = -460.13 X 10⁶ J/kg
- 9.14 **Heat of Decomposition:** Not pertinent
- 9.15 **Heat of Solution:** Not pertinent
- 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:** 190 psia

NOTES

<http://zenstoves.net>

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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
-180	41.480	-50	0.546		N O T P E R T I N E N T	-145	0.433
-175	41.290					-140	0.413
-170	41.100					-135	0.395
-165	40.910					-130	0.378
-160	40.720					-125	0.362
-155	40.530					-120	0.347
-150	40.340					-115	0.333
-145	40.150					-110	0.321
-140	39.960					-105	0.309
-135	39.770					-100	0.297
-130	39.580					-95	0.287
-125	39.390					-90	0.277
-120	39.190					-85	0.268
-115	39.000					-80	0.259
-110	38.810					-75	0.251
-105	38.620					-70	0.243
-100	38.430					-65	0.236
-95	38.240					-60	0.229
-90	38.050					-55	0.222
-85	37.860					-50	0.216
-80	37.670					-45	0.210
-75	37.480						
-70	37.290						
-65	37.100						
-60	36.910						
-55	36.720						

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
I N S O L U B I L I T Y		-230	0.002	-230	0.00003	0	0.349
		-220	0.004	-220	0.00007	25	0.365
		-210	0.009	-210	0.00015	50	0.381
		-200	0.019	-200	0.00031	75	0.397
		-190	0.039	-190	0.00060	100	0.413
		-180	0.074	-180	0.00109	125	0.429
		-170	0.134	-170	0.00190	150	0.444
		-160	0.230	-160	0.00315	175	0.459
		-150	0.380	-150	0.00504	200	0.474
		-140	0.605	-140	0.00777	225	0.489
		-130	0.931	-130	0.01160	250	0.504
		-120	1.393	-120	0.01685	275	0.519
		-110	2.029	-110	0.02384	300	0.533
		-100	2.886	-100	0.03296	325	0.548
		-90	4.017	-90	0.04463	350	0.562
		-80	5.480	-80	0.05929	375	0.576
		-70	7.344	-70	0.07741	400	0.590
		-60	9.680	-60	0.09948	425	0.603
		-50	12.570	-50	0.12600	450	0.617
		-40	16.090	-40	0.15750	475	0.630
		-30	20.340	-30	0.19440	500	0.643
		-20	25.400	-20	0.23730	525	0.657
						550	0.669
						575	0.682
						600	0.695