

# CYCLOHEXANE

CHX

## CAUTIONARY RESPONSE INFORMATION

Common Synonyms	Watery liquid Colorless Gasoline-like odor  Floats on water. Flammable irritating vapor is produced. Freezing point is 44°F.
<p>Keep people away. Shut off ignition sources and call fire department. Avoid contact with liquid and vapor. Stay upwind and use water spray to "knock down" vapor. Notify local health and pollution control agencies. Protect water intakes.</p>	
Fire	FLAMMABLE. Flashback along vapor trail may occur. Vapor may explode if ignited in an enclosed area. Extinguish with foam, dry chemicals or carbon dioxide. Water may be ineffective on fire. Cool exposed containers with water.
Exposure	CALL FOR MEDICAL AID.  VAPOR Irritating to eyes, nose and throat. If inhaled, will cause dizziness, nausea, vomiting or loss of consciousness. Move to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen.  LIQUID Irritating to skin and eyes. Harmful if swallowed. Remove contaminated clothing and shoes. Flush affected areas with plenty of water. IF IN EYES: hold eyelids open and flush with plenty of water. IF SWALLOWED, and victim is CONSCIOUS, have victim drink water or milk.
Water Pollution	Dangerous to aquatic life in high concentrations. Fouling to shoreline. May be dangerous if it enters water intakes. Notify local health and pollution control officials. Notify operators of nearby water intakes.

## 1. CORRECTIVE RESPONSE ACTIONS

Stop discharge  
Contain  
Collection Systems: Skim  
Chemical and Physical Treatment: Burn  
Clean shore line  
Salvage waterfowl

## 2. CHEMICAL DESIGNATIONS

2.1 CG Compatibility Group: 31; Paraffin  
2.2 Formula:  $C_6H_{12}$   
2.3 IMO/UN Designation: 3.1/1145  
2.4 DOT ID No.: 1145  
2.5 CAS Registry No.: 110-82-7  
2.6 NAERG Guide No.: 128  
2.7 Standard Industrial Trade Classification: 51121

## 3. HEALTH HAZARDS

- 3.1 Personal Protective Equipment: Hydrocarbon vapor canister, supplied-air or hose mask, hydrocarbon-insoluble rubber or plastic gloves, chemical goggles or face splash shield, hydrocarbon-insoluble rubber or plastic apron.  
 3.2 Symptoms Following Exposure: Dizziness, with nausea and vomiting. Concentrated vapor may cause unconsciousness and collapse.  
 3.3 Treatment of Exposure: INHALATION: remove victim to fresh air; if breathing stops, apply artificial respiration and administer oxygen. SKIN OR EYE CONTACT: remove contaminated clothing and gently flushed affected areas with water for 15 min.; call a physician.  
 3.4 TLV-TWA: 300 ppm  
 3.5 TLV-STEL: Not listed.  
 3.6 TLV-Ceiling: Not listed.  
 3.7 Toxicity by Ingestion: Grade 2; LD<sub>50</sub> = 0.5 to 5 g/kg  
 3.8 Toxicity by Inhalation: Currently not available.  
 3.9 Chronic Toxicity: None  
 3.10 Vapor (Gas) Irritancy Characteristics: Vapors cause a slight smarting of the eyes or respiratory system if present in high concentrations. The effect is temporary.  
 3.11 Liquid or Solid Characteristics: Minimum hazard. If spilled on clothing and allowed to remain, may cause smarting and reddening of the skin.  
 3.12 Odor Threshold: Currently not available  
 3.13 IDLH Value: 1,300 ppm  
 3.14 OSHA PEL-TWA: 300 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: -4°F C.C.  
 4.2 Flammable Limits in Air: 1.33%-8.35%  
 4.3 Fire Extinguishing Agents: Foam, carbon dioxide, dry chemical.  
 4.4 Fire Extinguishing Agents Not to Be Used: Water may be ineffective on fire.  
 4.5 Special Hazards of Combustion Products: Not pertinent  
 4.6 Behavior in Fire: Not pertinent  
 4.7 Auto Ignition Temperature: 518°F  
 4.8 Electrical Hazards: Currently not available

- 4.9 Burning Rate: 6.9 mm/min.  
 4.10 Adiabatic Flame Temperature: Currently not available  
 4.11 Stoichiometric Air to Fuel Ratio: 42.8 (calc.)  
 4.12 Flame Temperature: Currently not available  
 4.13 Combustion Molar Ratio (Reactant to Product): 12.0 (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: 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: 15,500 ppm/24 hr/mosquito fish/TL<sub>50</sub>/fresh water  
 6.2 Waterfowl Toxicity: Currently not available  
 6.3 Biological Oxygen Demand (BOD): Currently not available  
 6.4 Food Chain Concentration Potential: None  
 6.5 GESAMP Hazard Profile: Bioaccumulation: 0  
Damage to living resources: 3  
Human Oral hazard: 1  
Human Contact hazard: II  
Reduction of amenities: X

## 7. SHIPPING INFORMATION

- 7.1 Grades of Purity: Research grades: 99.5%, 98.0%; commercial: 85-98%  
 7.2 Storage Temperature: Ambient  
 7.3 Inert Atmosphere: No requirement  
 7.4 Venting: Open (flame arrester) or pressure-vacuum  
 7.5 IMO Pollution Category: C  
 7.6 Ship Type: 3  
 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: II  
 8.4 Marine Pollutant: No  
 8.5 NFPA Hazard Classification:

Category	Classification
Health Hazard (Blue)	1
Flammability (Red)	3
Instability (Yellow)	0

- 8.6 EPA Reportable Quantity: 1000 pounds  
 8.7 EPA Pollution Category: C  
 8.8 RCRA Waste Number: U056  
 8.9 EPA FWP/CA List: Yes

## 9. PHYSICAL & CHEMICAL PROPERTIES

- 9.1 Physical State at 15°C and 1 atm: Liquid  
 9.2 Molecular Weight: 84.16  
 9.3 Boiling Point at 1 atm: 177.3°F = 80.7°C = 353.9°K  
 9.4 Freezing Point: 43.8°F = 6.6°C = 279.8°K  
 9.5 Critical Temperature: 536.5°F = 280.3°C = 553.5°K  
 9.6 Critical Pressure: 591 psia = 40.2 atm = 4.07 MN/m<sup>2</sup>  
 9.7 Specific Gravity: 0.779 at 20°C (liquid)  
 9.8 Liquid Surface Tension: 24.6 dynes/cm = 0.0246 N/m at 20°C  
 9.9 Liquid Water Interfacial Tension: 50 dynes/cm = 0.050 N/m at 25°C  
 9.10 Vapor (Gas) Specific Gravity: 2.9  
 9.11 Ratio of Specific Heats of Vapor (Gas): 1.087  
 9.12 Latent Heat of Vaporization: 150 Btu/lb = 85 cal/g = 3.6 x 10<sup>3</sup> J/kg  
 9.13 Heat of Combustion: -18,684 Btu/lb = -10,380 cal/g = -434.59 x 10<sup>3</sup> 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: 7.47 cal/g  
 9.18 Limiting Value: Currently not available  
 9.19 Reid Vapor Pressure: 3.3 psia

## 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
55	49.030	45	0.421	65	0.838	52	1.125
60	48.870	50	0.424	70	0.833	54	1.101
65	48.710	55	0.427	75	0.829	56	1.078
70	48.550	60	0.429	80	0.824	58	1.055
75	48.390	65	0.432	85	0.819	60	1.033
80	48.230	70	0.435	90	0.814	62	1.012
85	48.060	75	0.438	95	0.810	64	0.991
90	47.900	80	0.441	100	0.805	66	0.971
95	47.730	85	0.443	105	0.800	68	0.952
100	47.570	90	0.446	110	0.795	70	0.933
105	47.400	95	0.449	115	0.791	72	0.914
110	47.230	100	0.452	120	0.786	74	0.896
115	47.060	105	0.454	125	0.781	76	0.879
120	46.890	110	0.457	130	0.776	78	0.862
125	46.720	115	0.460	135	0.772	80	0.845
130	46.550	120	0.463	140	0.767	82	0.829
135	46.370	125	0.466	145	0.762	84	0.813
140	46.200	130	0.468	150	0.757	86	0.798
145	46.020	135	0.471	155	0.752	88	0.783
150	45.850	140	0.474	160	0.748	90	0.768
155	45.670	145	0.477	165	0.743	92	0.754
160	45.490	150	0.479	170	0.738	94	0.740
165	45.320	155	0.482			96	0.727
170	45.140	160	0.485			98	0.714
175	44.960	165	0.488			100	0.701
		170	0.491			102	0.689

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
83	0.015	45	0.792	45	0.01230	0	0.247
		50	0.909	50	0.01309	25	0.265
		55	1.041	55	0.01587	50	0.283
		60	1.190	60	0.01795	75	0.300
		65	1.356	65	0.02026	100	0.317
		70	1.542	70	0.02282	125	0.335
		75	1.748	75	0.02564	150	0.352
		80	1.978	80	0.02874	175	0.369
		85	2.233	85	0.03214	200	0.385
		90	2.515	90	0.03588	225	0.402
		95	2.827	95	0.03996	250	0.419
		100	3.171	100	0.04442	275	0.435
		105	3.550	105	0.04928	300	0.451
		110	3.965	110	0.05457	325	0.467
		115	4.421	115	0.06032	350	0.483
		120	4.921	120	0.06655	375	0.499
		125	5.466	125	0.07330	400	0.515
		130	6.061	130	0.08059	425	0.531
		135	6.710	135	0.08846	450	0.546
		140	7.415	140	0.09694	475	0.561
		145	8.181	145	0.10610	500	0.576
		150	9.011	150	0.11590	525	0.592
		155	9.910	155	0.12640	550	0.606
		160	10.880	160	0.13770	575	0.621
		165	11.930	165	0.14970	600	0.636
		170	13.060	170	0.16260		