

# CYANOGEN

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CAUTIONARY RESPONSE INFORMATION				4. FIRE HAZARDS	7. SHIPPING INFORMATION
Common Synonyms Dicyan Dicyanogen Ethane dinitrile Oxalic acid dinitrile Oxalonitrile	Gas Colorless Almond Odor	Floats and boils on water. Poisonous, flammable visible vapor cloud is produced.			
<b>KEEP PEOPLE AWAY. AVOID CONTACT WITH LIQUID AND VAPOR.</b> Avoid inhalation. Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves). Shut off ignition sources. Call fire department. Evacuate area in case of large discharge. Stay upwind. Use water spray to "knock down" vapor. Notify local health and pollution control agencies. Protect water intakes.				4.1 Flash Point: Flammable gas	7.1 Grades of Purity: 98.5%
<b>Fire</b> FLAMMABLE. POISONOUS GASES ARE PRODUCED IN FIRE. Containers may explode in fire. Flashback along vapor trail may occur. Vapor may explode if ignited in an enclosed area. Wear goggles, self-contained breathing apparatus and rubber overclothing (including gloves). Let fire burn. Stop flow of gas if possible. Cool exposed containers and protect men effecting shutoff with water.				4.2 Flammable Limits in Air: 6.6%-43%	7.2 Storage Temperature: Cool ambient
<b>Exposure</b> CALL FOR MEDICAL AID.  <b>VAPOR</b> POISONOUS IF INHALED. Irritating to eyes. Move victim to fresh air. If in eyes, hold eyelids open and flush with plenty of water. If breathing has stopped, give artificial respiration (but not mouth-to-mouth).				4.3 Fire Extinguishing Agents: Let fire burn, shut off flow of gas, cool exposed areas with water.	7.3 Inert Atmosphere: No requirement
<b>LIQUID</b> POISONOUS IF SWALLOWED. Will cause frostbite. Remove contaminated clothing and shoes. Flush affected areas with plenty of water. DO NOT RUB AFFECTED AREAS. IF IN EYES, hold eyelids open and flush with plenty of water. IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk and have victim induce vomiting. IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim warm.				4.4 Fire Extinguishing Agents Not to Be Used: Not pertinent	7.4 Venting: Store containers in well ventilated area
<b>Water Pollution</b> 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.				4.5 Special Hazards of Combustion Products: Unburned vapors are highly toxic.	7.5 IMO Pollution Category: Currently not available
<b>1. CORRECTIVE RESPONSE ACTIONS</b> Dilute and disperse Stop discharge Do not burn				4.6 Behavior in Fire: Vapor is heavier than air and may travel considerable distance to a source of ignition and flash back. Containers may explode in fire, releasing the highly toxic gas.	7.6 Ship Type: Currently not available
<b>2. CHEMICAL DESIGNATIONS</b> 2.1 CG Compatibility Group: Not listed. 2.2 Formula: (CN) <sub>2</sub> 2.3 IMO/UN Designation: 2/1026 2.4 DOT ID No.: 1026 2.5 CAS Registry No.: 460-19-5 2.6 NAERG Guide No.: 119 2.7 Standard Industrial Trade Classification: 51484				4.7 Auto Ignition Temperature: Currently not available	7.7 Barge Hull Type: Currently not available
<b>3. HEALTH HAZARDS</b> 3.1 Personal Protective Equipment: Self-contained breathing apparatus; rubber gloves; rubber protective clothing; rubber-soled shoes. 3.2 Symptoms Following Exposure: Vapor irritates eyes and causes giddiness, headache, fatigue, and nausea if inhaled. 3.3 Treatment of Exposure: In general, treatment is similar to that used following exposure to hydrogen cyanide. INHALATION: move victim to fresh air and have him lie down; do not permit him to exert himself; remove contaminated clothing but keep patient covered and comfortably warm; summon a physician; break an amyl nitrite pearl in a cloth and hold it lightly under the victim's nose for 15 seconds; repeat five times at about 15-sec. intervals; use artificial respiration if breathing has stopped. EYES: flush with water for at least 15 min. 3.4 TLV-TWA: 10 ppm 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: Currently not available 3.10 Vapor (Gas) Irritancy 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				4.8 Electrical Hazards: Currently not available	8. HAZARD CLASSIFICATIONS
				4.9 Burning Rate: Not pertinent	8.1 49 CFR Category: Poison gas
				4.10 Adiabatic Flame Temperature: Currently not available	8.2 49 CFR Class: 2.3
				4.11 Stoichiometric Air to Fuel Ratio: 19.0 (calc.)	8.3 49 CFR Package Group: Not pertinent
				4.12 Flame Temperature: Currently not available	8.4 Marine Pollutant: Yes
				4.13 Combustion Molar Ratio (Reactant to Product): 4.0 (calc.)	8.5 NFPA Hazard Classification:
				4.14 Minimum Oxygen Concentration for Combustion (MOCC): Not listed	Category Classification Health Hazard (Blue)..... 4 Flammability (Red)..... 4 Instability (Yellow)..... 2
				<b>5. CHEMICAL REACTIVITY</b> 5.1 Reactivity with Water: No reaction, but water provides heat to vaporize liquid cyanogen.	
				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
				<b>6. WATER POLLUTION</b> 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: None	6.5 GESAMP Hazard Profile: Not listed
				<b>7. SHIPPING INFORMATION</b> 7.1 Grades of Purity: 98.5%	
				7.2 Storage Temperature: Cool ambient	7.3 Inert Atmosphere: No requirement
				7.4 Venting: Store containers in well ventilated area	7.5 IMO Pollution Category: Currently not available
				7.6 Ship Type: Currently not available	7.7 Barge Hull Type: Currently not available
				<b>8. HAZARD CLASSIFICATIONS</b> 8.1 49 CFR Category: Poison gas	
				8.2 49 CFR Class: 2.3	8.3 49 CFR Package Group: Not pertinent
				8.4 Marine Pollutant: Yes	8.4 Marine Pollutant: Yes
				8.5 NFPA Hazard Classification:	Category Classification Health Hazard (Blue)..... 4 Flammability (Red)..... 4 Instability (Yellow)..... 2
				8.6 EPA Reportable Quantity: 100 pounds	8.6 EPA Reportable Quantity: 100 pounds
				8.7 EPA Pollution Category: B	8.7 EPA Pollution Category: B
				8.8 RCRA Waste Number: P031	8.8 RCRA Waste Number: P031
				8.9 EPA FWCPC List: Not listed	8.9 EPA FWCPC List: Not listed
				<b>9. PHYSICAL &amp; CHEMICAL PROPERTIES</b> 9.1 Physical State at 15°C and 1 atm: Gas	
				9.2 Molecular Weight: 52.0	9.2 Molecular Weight: 52.0
				9.3 Boiling Point at 1 atm: -6.1°F = -21.1°C = 252.1°K	9.3 Boiling Point at 1 atm: -6.1°F = -21.1°C = 252.1°K
				9.4 Freezing Point: -18.2°F = -27.9°C = 245.3°K	9.4 Freezing Point: -18.2°F = -27.9°C = 245.3°K
				9.5 Critical Temperature: 259.9°F = 126.6°C = 399.8°K	9.5 Critical Temperature: 259.9°F = 126.6°C = 399.8°K
				9.6 Critical Pressure: 857 psia = 58.2 atm = 5.91 MN/m²	9.6 Critical Pressure: 857 psia = 58.2 atm = 5.91 MN/m²
				9.7 Specific Gravity: 0.954 at -21°C (liquid)	9.7 Specific Gravity: 0.954 at -21°C (liquid)
				9.8 Liquid Surface Tension: 22 dynes/cm = 0.022 N/m at -21°C	9.8 Liquid Surface Tension: 22 dynes/cm = 0.022 N/m at -21°C
				9.9 Liquid Water Interfacial Tension: Not pertinent	9.9 Liquid Water Interfacial Tension: Not pertinent
				9.10 Vapor (Gas) Specific Gravity: 1.8	9.10 Vapor (Gas) Specific Gravity: 1.8
				9.11 Ratio of Specific Heats of Vapor (Gas): 1.205 at 25°C	9.11 Ratio of Specific Heats of Vapor (Gas): 1.205 at 25°C
				9.12 Latent Heat of Vaporization: 200 Btu/lb = 111 cal/g = 4.65 X 10³ J/kg	9.12 Latent Heat of Vaporization: 200 Btu/lb = 111 cal/g = 4.65 X 10³ J/kg
				9.13 Heat of Combustion: -9,059 Btu/lb = -5,033 cal/g = -210.6 X 10³ J/kg	9.13 Heat of Combustion: -9,059 Btu/lb = -5,033 cal/g = -210.6 X 10³ J/kg
				9.14 Heat of Decomposition: Not pertinent	9.14 Heat of Decomposition: Not pertinent
				9.15 Heat of Solution: 2,520 Btu/lb = 1,400 cal/g = 58.5 X 10³ J/kg	9.15 Heat of Solution: 2,520 Btu/lb = 1,400 cal/g = 58.5 X 10³ J/kg
				9.16 Heat of Polymerization: Not pertinent	9.16 Heat of Polymerization: Not pertinent
				9.17 Heat of Fusion: Currently not available	9.17 Heat of Fusion: Currently not available
				9.18 Limiting Value: Currently not available	9.18 Limiting Value: Currently not available
				9.19 Reid Vapor Pressure: Currently not available	9.19 Reid Vapor Pressure: Currently not available
				<b>NOTES</b>	

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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
-18	59.970	-18	0.300	-18	0.967	-18	0.447
-17	59.940	-17	0.300	-17	0.967	-17	0.443
-16	59.900	-16	0.300	-16	0.967	-16	0.439
-15	59.870	-15	0.300	-15	0.967	-15	0.435
-14	59.840	-14	0.300	-14	0.967	-14	0.431
-13	59.801	-13	0.300	-13	0.967	-13	0.427
-12	59.770	-12	0.300	-12	0.967	-12	0.423
-11	59.730	-11	0.300	-11	0.967	-11	0.420
-10	59.700	-10	0.300	-10	0.967	-10	0.416
-9	59.660	-9	0.300	-9	0.967	-9	0.412
-8	59.630	-8	0.300	-8	0.967	-8	0.409
-7	59.590	-7	0.300	-7	0.967	-7	0.405

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
M	-10	13.260	-10	0.14290	30	0.252	
I	-5	15.060	5	0.16040	35	0.253	
S	0	17.050	0	0.17960	40	0.254	
C	5	19.250	5	0.20070	45	0.255	
I	10	21.680	10	0.22360	50	0.256	
B	15	24.360	15	0.24860	55	0.256	
L	20	27.300	20	0.27570	60	0.257	
E	25	30.520	25	0.30510	65	0.258	
	30	34.050	30	0.33680	70	0.259	
	35	37.900	35	0.37120	75	0.260	
	40	42.100	40	0.40810	80	0.260	
	45	46.660	45	0.44790	85	0.261	
	50	51.610	50	0.49060	90	0.262	
	55	56.980	55	0.53630	95	0.263	
	60	62.790	60	0.58530	100	0.264	
	65	69.059	65	0.63760	105	0.265	
	70	75.820	70	0.69340	110	0.265	
	75	83.089	75	0.75280	115	0.266	
	80	90.910	80	0.81610	120	0.267	
	85	99.299	85	0.88320	125	0.268	
					130	0.269	
					135	0.269	
					140	0.270	
					145	0.271	
					150	0.272	