

MORPHOLINE

MPL

CAUTIONARY RESPONSE INFORMATION				7. SHIPPING INFORMATION	
Common Synonyms Diethyleneimide oxide Diethylene imidoxide Diethylene oxide Tetrahydro-2H-1, 4-oxazine Tetrahydro-p-oxazine	Oily liquid Floats and mixes with water. Irritating vapor is produced.	Colorless	Fishy, ammonia odor	7.1 Grades of Purity: Several grades available, most above 99%.	7.2 Storage Temperature: Ambient
Avoid contact with liquid and vapor. Call fire department. Notify local health and pollution control agencies.				7.3 Inert Atmosphere: No requirement	7.4 Venting: Open
Fire	FLAMMABLE Flashback along vapor trail may occur. Vapor may explode if ignited in an enclosed area. Extinguish with water, dry chemical, or carbon dioxide. Cool exposed containers with water.				7.5 IMO Pollution Category: D
Exposure	CALL FOR MEDICAL AID. VAPOR Irritating to eyes, nose and throat. If inhaled, will cause nausea, headache, or difficult breathing. Move to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen. LIQUID Irritating to skin and eyes. 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 and have victim induce vomiting. IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim warm.				7.6 Ship Type: 3
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.				7.7 Barge Hull Type: 3

1. CORRECTIVE RESPONSE ACTIONS	2. CHEMICAL DESIGNATIONS
Dilute and disperse Stop discharge	2.1 CG Compatibility Group: 7; Aliphatic amine 2.2 Formula: OCH ₂ CH ₂ NHCH ₂ CH ₃ 2.3 IMO/UN Designation: 3.3/2054 2.4 DOT ID No.: 2054 2.5 CAS Registry No.: 110-91-8 2.6 NAERG Guide No.: 132 2.7 Standard Industrial Trade Classification: 51579
3. HEALTH HAZARDS	
3.1 Personal Protective Equipment: Organic vapor canister or self-contained breathing apparatus; rubber boots and gloves; goggles or face shield.	
3.2 Symptoms Following Exposure: Liquid causes skin and eye burns. Breathing vapors or absorption through skin may cause nausea and headache.	
3.3 Treatment of Exposure: INHALATION: if ill effects occur, move patient to fresh air, keep him quiet and warm, and call a physician; if breathing stops, start artificial respiration. INGESTION: force milk or water, then immediately induce vomiting; treat symptomatically; no known antidote. SKIN OR EYES: Immediately flush with plenty of water for at least 15 min.; for eyes get medical attention promptly.	
3.4 TLV-TWA: 20 ppm 3.5 TLV-STEL: Not listed. 3.6 TLV-Ceiling: Not listed. 3.7 Toxicity by Ingestion: Grade 2; LD ₅₀ = 0.5 to 5 g/kg (guinea pig, rat) 3.8 Toxicity by Inhalation: Currently not available. 3.9 Chronic Toxicity: Currently not available 3.10 Vapor (Gas) Irritant 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: 0.01 ppm 3.13 IDLH Value: 1,400 ppm 3.14 OSHA PEL-TWA: 20 ppm 3.15 OSHA PEL-STEL: Not listed. 3.16 OSHA PEL-Ceiling: Not listed. 3.17 EPA AEGL: Not listed	

4. FIRE HAZARDS		7. HAZARD CLASSIFICATIONS	
4.1 Flash Point: 100°F O.C.	4.2 Flammable Limits in Air: 1.8%-10.8%	8.1 49 CFR Category: Flammable liquid	8.2 49 CFR Class: 3
4.3 Fire Extinguishing Agents: Water fog, alcohol foam, dry chemical, or carbon dioxide	4.4 Fire Extinguishing Agents Not to Be Used: Not pertinent	8.3 49 CFR Package Group: III	8.4 Marine Pollutant: No
4.5 Special Hazards of Combustion Products: Irritating vapors are generated when heated.	4.6 Behavior in Fire: Vapor is heavier than air and may travel some distance to source of ignition and flash back.	8.5 NFPA Hazard Classification:	
4.7 Auto Ignition Temperature: 590°F	4.8 Electrical Hazards: Not pertinent	Category	Classification
4.9 Burning Rate: 1.9 mm/min	4.10 Adiabatic Flame Temperature: Currently not available	Health Hazard (Blue).....	2
4.11 Stoichiometric Air to Fuel Ratio: 32.1 (calc.)	4.12 Flame Temperature: Currently not available	Flammability (Red).....	3
4.13 Combustion Molar Ratio (Reactant to Product): 9.5 (calc.)	4.14 Minimum Oxygen Concentration for Combustion (MOCC): Not listed	Instability (Yellow).....	0
5. CHEMICAL REACTIVITY		8. PHYSICAL & CHEMICAL PROPERTIES	
5.1 Reactivity with Water: No reaction	5.2 Reactivity with Common Materials: No reaction	9.1 Physical State at 15° C and 1 atm: Liquid	9.2 Molecular Weight: 87.12
5.3 Stability During Transport: Stable	5.4 Neutralizing Agents for Acids and Caustics: Flush with water	9.3 Boiling Point at 1 atm: 262.8°F = 128.2°C = 401.4°K	9.4 Freezing Point: 23.4°F = -4.8°C = 268.4°K
5.5 Polymerization: Not pertinent	5.6 Inhibitor of Polymerization: Not pertinent	9.5 Critical Temperature: 653.0°F = 345°C = 618.2°K	9.6 Critical Pressure: 794 psia = 54 atm = 5.47 MN/m ²
6. WATER POLLUTION		9.7 Specific Gravity: 1.00 at 20°C (liquid)	9.8 Liquid Surface Tension: Not pertinent
6.1 Aquatic Toxicity: Currently not available	6.2 Waterfowl Toxicity: Currently not available	9.9 Liquid Water Interfacial Tension: Not pertinent	9.10 Vapor (Gas) Specific Gravity: Not pertinent
6.3 Biological Oxygen Demand (BOD): (theor.) 0.9%, 5 days; 5.1%, 20 days	6.4 Food Chain Concentration Potential: None	9.11 Ratio of Specific Heats of Vapor (Gas): (est.) 1.091	9.12 Latent Heat of Vaporization: 182.9 Btu/lb = 101.6 cal/g = 4.254 X 10 ⁵ J/kg
6.5 GESAMP Hazard Profile: Bioaccumulation: 0 Damage to living resources: 2 Human Oral hazard: 1 Human Contact hazard: I Reduction of amenities: 0	9.13 Heat of Combustion: Currently not available 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: 0.55 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
35	63.740	70	0.476		N		N
40	63.550	75	0.477		O		O
45	63.360	80	0.479		T		T
50	63.170	85	0.480		P		P
55	62.980	90	0.481		E		E
60	62.790	95	0.482		R		R
65	62.600	100	0.484		I		I
70	62.410	105	0.485		N		N
75	62.220	110	0.486		E		E
80	62.030	115	0.488		N		N
85	61.840	120	0.489		E		E
90	61.650	125	0.490		N		N
95	61.450	130	0.492		E		E
100	61.260	135	0.493		N		N
105	61.070	140	0.494		E		E
110	60.880	145	0.496		N		N
115	60.690	150	0.497		E		E
120	60.500	155	0.498		N		N
		160	0.499		T		T
		165	0.501		P		P
		170	0.502		E		E
		175	0.503		R		R
		180	0.505		I		I
		185	0.506		N		N
		190	0.507		E		E
		195	0.509		N		N

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	-30		0.002	-30	0.00003	50	0.274
I	-20		0.003	-20	0.00005	52	0.274
S	-10		0.005	-10	0.00009	54	0.274
C	0		0.008	0	0.00014	56	0.274
I	10		0.013	10	0.00023	58	0.274
B	20		0.021	20	0.00036	60	0.274
L	30		0.033	30	0.00054	62	0.274
E	40		0.049	40	0.00080	64	0.274
	50		0.073	50	0.00117	66	0.274
	60		0.106	60	0.00166	68	0.274
	70		0.152	70	0.00232	70	0.274
	80		0.213	80	0.00320	72	0.274
	90		0.294	90	0.00434	74	0.274
	100		0.401	100	0.00581	76	0.274
	110		0.538	110	0.00767	78	0.274
	120		0.714	120	0.00999	80	0.274
	130		0.936	130	0.01288	82	0.274
	140		1.213	140	0.01641	84	0.274
	150		1.556	150	0.02071		
	160		1.976	160	0.02588		
	170		2.487	170	0.03205		
	180		3.102	180	0.03936		
	190		3.838	190	0.04795		
	200		4.712	200	0.05797		
	210		5.742	210	0.06959		
	220		6.949	220	0.08297		