

TRIETHYLENETETRAMINE

TET

CAUTIONARY RESPONSE INFORMATION

Common Synonyms N,N'-bis-(2-Aminoethyl)ethylenediamine TETA Trien	Oily liquid Floats and mixes with water.	Light straw to amber	Ammonia odor
<p>Keep people away. Avoid contact with liquid. Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves). Call fire department. Notify local health and pollution control agencies. Protect water intakes.</p>			
Fire Combustible. Extinguish with dry chemical, alcohol foam, or carbon dioxide. Water may be ineffective on fire.			
Exposure CALL FOR MEDICAL AID. LIQUID Will burn 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. DO NOT INDUCE VOMITING.			
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 Dilute and disperse Stop discharge Contain Collection Systems: Skim Salvage waterfowl	2. CHEMICAL DESIGNATIONS 2.1 CG Compatibility Group: 7; Aliphatic amine 2.2 Formula: $\text{NH}_2(\text{CH}_2)_2\text{NH}(\text{CH}_2)_2\text{NH}(\text{CH}_2)_2\text{NH}_2$ 2.3 IMO/UN Designation: Not listed 2.4 DOT ID No.: 2259 2.5 CAS Registry No.: 112-24-3 2.6 NAERG Guide No.: 153 2.7 Standard Industrial Trade Classification: 51452
3. HEALTH HAZARDS	
3.1 Personal Protective Equipment: Amine-type canister; goggles or face shield; rubber gloves. 3.2 Symptoms Following Exposure: Vapors from hot liquid can irritate eyes and upper respiratory system. Liquid burns eyes and skin. May cause sensitization of skin. 3.3 Treatment of Exposure: INHALATION: remove victim to fresh air. INGESTION: do NOT induce vomiting; give large quantities of water; give at least one ounce of vinegar in equal amount of water; get medical attention. SKIN: flush with plenty of water. EYES: flush with plenty of water for at least 15 min. and get medical attention. 3.4 TLV-TWA: Not listed. 3.5 TLV-STEL: Not listed. 3.6 TLV-Ceiling: Not listed. 3.7 Toxicity by Ingestion: Grade 2; $\text{LD}_{50} = 0.5$ to 5 g/kg (rat) 3.8 Toxicity by Inhalation: Currently not available. 3.9 Chronic Toxicity: May cause dermatitis, asthma and other allergic reactions in man. 3.10 Vapor (Gas) Irritant Characteristics: Vapors cause moderate irritation such that personnel will find high concentrations unpleasant. The effect is temporary. 3.11 Liquid or Solid Characteristics: Causes smarting of the skin and first-degree burns on short exposure; may cause secondary burns on long exposure. 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: 290°F O.C. 275°F C.C. 4.2 Flammable Limits in Air: Currently not available 4.3 Fire Extinguishing Agents: Dry chemical, alcohol foam, carbon dioxide 4.4 Fire Extinguishing Agents Not to Be Used: Water or foam may cause frothing. 4.5 Special Hazards of Combustion Products: Not pertinent 4.6 Behavior in Fire: Not pertinent 4.7 Auto Ignition Temperature: 640°F 4.8 Electrical Hazards: Not pertinent 4.9 Burning Rate: Currently not available 4.10 Adiabatic Flame Temperature: Currently not available 4.11 Stoichiometric Air to Fuel Ratio: 69.0 (calc.) 4.12 Flame Temperature: Currently not available 4.13 Combustion Molar Ratio (Reactant to Product): 19.0 (calc.) 4.14 Minimum Oxygen Concentration for Combustion (MOCC): Not listed	7. SHIPPING INFORMATION 7.1 Grades of Purity: 99+%								
	7.2 Storage Temperature: Ambient 7.3 Inert Atmosphere: No requirement 7.4 Venting: Open 7.5 IMO Pollution Category: D 7.6 Ship Type: 3 7.7 Barge Hull Type: 3								
	8. HAZARD CLASSIFICATIONS 8.1 49 CFR Category: Corrosive material 8.2 49 CFR Class: 8 8.3 49 CFR Package Group: II 8.4 Marine Pollutant: No 8.5 NFPA Hazard Classification: <table border="0"> <tr> <td>Category</td> <td>Classification</td> </tr> <tr> <td>Health Hazard (Blue).....</td> <td>3</td> </tr> <tr> <td>Flammability (Red).....</td> <td>1</td> </tr> <tr> <td>Instability (Yellow).....</td> <td>0</td> </tr> </table>	Category	Classification	Health Hazard (Blue).....	3	Flammability (Red).....	1	Instability (Yellow).....	0
Category	Classification								
Health Hazard (Blue).....	3								
Flammability (Red).....	1								
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 FWCRA List: Not listed								
	9. PHYSICAL & CHEMICAL PROPERTIES 9.1 Physical State at 15°C and 1 atm: Liquid 9.2 Molecular Weight: 146.24 9.3 Boiling Point at 1 atm: 531.3°F = 277.4°C = 550.6°K 9.4 Freezing Point: -31°F = -35°C = 238°K 9.5 Critical Temperature: 860.0°F = 460°C = 733.2°K 9.6 Critical Pressure: 470 psia = 32 atm = 3.2 MN/m² 9.7 Specific Gravity: 0.982 at 20°C (liquid) 9.8 Liquid Surface Tension: Not pertinent 9.9 Liquid Water Interfacial Tension: Not pertinent 9.10 Vapor (Gas) Specific Gravity: Not pertinent 9.11 Ratio of Specific Heats of Vapor (Gas): 1.037 9.12 Latent Heat of Vaporization: Not pertinent 9.13 Heat of Combustion: (est.) -13,500 Btu/lb = -7,530 cal/g = -315 X 10³ J/kg 9.14 Heat of Decomposition: Not pertinent 9.15 Heat of Solution: (est.) -13 Btu/lb = -7 cal/g = -0.3 X 10³ J/kg 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: Low								

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	62.280	85	0.607		N		N
40	62.140	90	0.612		O		O
45	62.000	95	0.617		T		T
50	61.860	100	0.622		P		P
55	61.720	105	0.627		E		E
60	61.580	110	0.633		R		R
65	61.440	115	0.638		T		T
70	61.310	120	0.643		I		I
75	61.170	125	0.648		N		N
80	61.030	130	0.653		E		E
85	60.890	135	0.658		N		N
90	60.750	140	0.663		E		E
95	60.610	145	0.669		N		N
100	60.470	150	0.674		T		T
105	60.340						P
110	60.200						E
115	60.060						T
120	59.920						I

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	300	0.241	300	0.00431	0	0	0.344
I	320	0.391	320	0.00683	25	25	0.357
S	340	0.614	340	0.01046	50	50	0.370
C	360	0.938	360	0.01559	75	75	0.383
I	380	1.395	380	0.02263	100	100	0.396
B	400	2.025	400	0.03209	125	125	0.409
L	420	2.876	420	0.04454	150	150	0.421
E	440	4.003	440	0.06062	175	175	0.433
	460	5.471	460	0.08105	200	200	0.445
	480	7.352	480	0.10660	225	225	0.457
	500	9.727	500	0.13810	250	250	0.468
	520	12.690	520	0.17640	275	275	0.480
	540	16.330	540	0.22250	300	300	0.491
	560	20.750	560	0.27730	325	325	0.502
	580	26.080	580	0.34180	350	350	0.512
	600	32.430	600	0.41690	375	375	0.523
					400	400	0.533
					425	425	0.543
					450	450	0.553
					475	475	0.563
					500	500	0.572
					525	525	0.581
					550	550	0.590
					575	575	0.599
					600	600	0.608