Material Safety Data Sheet

Triethylamine

Section 1 - Chemical Product

MSDS Name: Triethylamine
Synonyms: TEN; N,N-Diethylethanamine; (Diethylamino)ethane; a tertiary alkylamine; a strong organic base. (Not to be confused with triethanolamine or TEA)

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
121-44-8	Triethylamine	>99	204-469-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear, colorless liquid. Flash Point: -11 deg C.
Danger! Extremely flammable liquid and vapor. Vapor may cause flash fire. Causes burns by all exposure routes. Harmful if swallowed, inhaled, or absorbed through the skin. May cause lung damage.
Target Organs: Lungs, cardiovascular system, eyes, skin, mucous membranes.

Potential Health Effects
Eye: Causes eye burns. Lachrymator (substance which increases the flow of tears). Low vapor concentrations may cause a temporary visual disturbance known as 'blue haze' or 'halo vision'.
Skin: Harmful if absorbed through the skin. Causes skin burns. The severity of injury depends on the concentration of the solution and the duration of exposure.
Ingestion: Harmful if swallowed. Causes gastrointestinal tract burns.
Inhalation: Harmful if inhaled. Causes chemical burns to the respiratory tract. Effects of inhalation may be delayed. Vapors may cause lung injury. May cause central nervous system effects. Extreme exposures could result in a build-up of fluid in the lungs (pulmonary edema) that might be fatal in severe cases.
Chronic: Prolonged inhalation may cause respiratory tract inflammation and lung damage. Prolonged or repeated skin contact may cause defatting and dermatitis.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for a t least 15 minutes. Get medical aid immediately.
Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.
Ingestion: If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.
Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Extremely flammable liquid and vapor. Vapor may cause flash fire. Vapors are heavier than air and may travel to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas.
Extinguishing Media: Use water spray, dry chemical, or "alcohol resistant" foam. Do not use carbon dioxide because carbon dioxide reacts with amines to form thermally unstable carbamate salts.
Flash Point: -11 deg C (12.20 deg F)
Autoignition Temperature: 215 deg C (419.00 deg F)
Explosion Limits, Lower:1.2%
Upper: 8.0%
NFPA Rating: (estimated) Health: 3; Flammability: 3; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Remove all sources of ignition. Provide ventilation. A vapor suppressing foam may be used to reduce vapors. Approach spill from upwind. Use only non-sparking tools and equipment. Use water spray to cool and disperse vapors and protect personnel.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Do not get in eyes, on skin, or on clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Discard contaminated shoes. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Do not breathe vapor. Use only with adequate ventilation. Keep away from heat, sparks and flame.
Storage: Keep away from sources of ignition. Keep container closed when not in use. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from strong acids. Keep away from organic halogens.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Triethylamine	1 ppm TWA; 3 ppm STEL; Skin - potential significant contribution to overall exposure by the cutaneous r oute	200 ppm IDLH	25 ppm TWA; 100 mg/m3 TWA

OSHA Vacated PELs: Triethylamine: 10 ppm TWA; 40 mg/m3 TWA
Personal Protective Equipment
Eyes: Wear chemical splash goggles and face shield.
Skin: Wear appropriate protective gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Liquid
Appearance: clear, colorless

Odor: strong odor - fishy ammoniacal
pH: 12.4 (10% aq soln)
Vapor Pressure: 57.1 mm Hg @ 25 deg C
Vapor Density: 3.5 (air=1)
Evaporation Rate:5.6 (Butyl acetate=1)
Viscosity: Not available.
Boiling Point: 89-90 deg C
Freezing/Melting Point:-115 deg C
Decomposition Temperature: Not available.
Solubility: 73.7 g/L
Specific Gravity/Density: 0.73 g/ml
Molecular Formula:C6H15N
Molecular Weight:101.19

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Oxidizes when exposed to air. Amines absorb carbon dioxide from the air to form carbamate salts.
Conditions to Avoid: Ignition sources, prolonged exposure to air, confined spaces.
Incompatibilities with Other Materials: Strong oxidizing agents, strong acids, halogenated hydrocarbons, some metals.
Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon dioxide, amines.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 121-44-8: YE0175000
LD50/LC50:
CAS# 121-44-8:
Inhalation, mouse: LC50 = 6 gm/m3;
Oral, mouse: LD50 = 546 mg/kg;
Oral, rat: LD50 = 460 mg/kg;
Skin, rabbit: LD50 = 570 uL/kg;
.

Carcinogenicity:
CAS# 121-44-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: Ocular injuries consisting of corneal opacities with clouding and swelling have been reported in workers exposed to TEN. Exposure to TEN at 5 ppm for 8 hours can induce transient corneal edema which resolves within hours after termination of exposure.
Teratogenicity: Fetotoxicity occurred at triethylamine doses less than those associated with maternal intoxication when injected into pregnant rabbits. No studies concerning the potential developmental toxicity of TEN by relevant routes of exposure have been found.

Reproductive Effects: No effects on reproductive parameters could be detected when rats consumed up to 500 ppm TEN in drinking water for 3 generations.
Mutagenicity: See actual entry in RTECS for complete information.
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series:
CAS# 121-44-8: waste number U404.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	TRIETHYLAMINE	TRIETHYLAMINE
Hazard Class:	3	3(8)
UN Number:	UN1296	UN1296
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA
CAS# 121-44-8 is listed on the TSCA inventory.
Health & Safety Reporting List
CAS# 121-44-8: Effective 1/13/84, Sunset 1/13/94
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 121-44-8: 5000 lb final RQ; 2270 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 121-44-8: immediate, delayed, fire.

Section 313

This material contains Triethylamine (CAS# 121-44-8, >99%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR

Clean Air Act:

CAS# 121-44-8 is listed as a hazardous air pollutant (HAP).
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 121-44-8 is listed as a Hazardous Substance under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 121-44-8 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

F C

Risk Phrases:

R 11 Highly flammable.
R 20/21/22 Harmful by inhalation, in contact with skin and if swallowed.
R 35 Causes severe burns.

Safety Phrases:

S 16 Keep away from sources of ignition - No smoking.
S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 29 Do not empty into drains.
S 3 Keep in a cool place.
S 36/37/39 Wear suitable protective clothing, gloves and eye/face pr otection.
S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 121-44-8: 1

Canada - DSL/NDSL

CAS# 121-44-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B2, D1B, E.
This product has been classified in accordance with the hazard criteria of the Controlled

Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 121-44-8 is listed on the Canadian Ingredient Disclosure List.