Material Safety Data Sheet
Triethylenetetramine

ACC# 24040

Section 1 - Chemical Product and Company Identification

MSDS Name: Triethylenetetramine
Catalog Numbers: T410-1, T410-500
Synonyms: N,N-bis(2aminoethyl)-1,2-diaminoethane; 3,6-diazaoctave-1,8-diamine; Tecza; TETA; Trien; Trientine
Company Identification:
Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410
For information, call: 201-796-7100
Emergency Number: 201-796-7100
For CHEMTREC assistance, call: 800-424-9300
For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
112-24-3	Triethylene tetramine	100	203-950-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: light yellow liquid.
Danger! Causes eye and skin burns. Causes digestive and respiratory tract burns. Harmful if absorbed through the skin. May cause allergic skin reaction.
Target Organs: Eyes, skin, mucous membranes.

Potential Health Effects
Eye: Causes severe eye burns. Low vapor concentrations may cause a temporary visual disturbance known as 'blue haze' or 'halo vision'.
Skin: Harmful if absorbed through the skin. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. May cause severe irritation and possible burns.
Ingestion: May cause severe and permanent damage to the digestive tract. May cause severe gastrointestinal tract irritation with nausea, vomiting and possible burns.
Inhalation: May cause severe irritation of the upper respiratory tract with pain, burns, and inflammation. In rare instances, exposure may cause sensitization, resulting in inflammation of the mucous membranes and in eczematous eruptions.
Chronic: Prolonged or repeated skin contact may cause sensitization dermatitis and possible destruction and/or ulceration. Repeated exposure may cause allergic respiratory reaction (asthma).

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately. Do NOT allow victim to rub eyes or keep eyes closed.
Skin: Get medical aid immediately. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Destroy contaminated shoes.
Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Treat symptomatically and supportively. Get medical aid immediately.
Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation.
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. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. May polymerize explosively when involved in a fire. Contact with metals may evolve flammable hydrogen gas. Containers may explode when heated.
Extinguishing Media: Do NOT get water inside containers. For small fires, use dry chemical, carbon dioxide, or water spray. For large fires, use dry chemical, carbon dioxide, alcohol-resistant foam, or water spray. Cool containers with flooding quantities of water until well after fire is out.
Flash Point: 135 deg C (275.00 deg F)
Autoignition Temperature: 338 deg C (640.40 deg F)
Explosion Limits, Lower:.7
Upper: 7.2
NFPA Rating: (estimated) Health: 3; Flammability: 1; 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. Avoid generating dusty conditions. Remove all sources of ignition. Provide ventilation. Do not get water inside containers.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Wash hands before eating. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale. Wash clothing before reuse. Discard contaminated shoes.
Storage: Store in a cool, dry place. Corrosives area. Do not store in metal containers. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Triethylene tetramine	none listed	none listed	none listed

OSHA Vacated PELs: Triethylene tetramine: No OSHA Vacated PELs are listed for this chemical.
Personal Protective Equipment
Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin: Wear appropriate protective gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure. Wear an impervious apron.
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: light yellow
Odor: ammonia-like
pH: 10
Vapor Pressure: < .01 mm Hg @ 2
Vapor Density: 5.1
Evaporation Rate: Not available.
Viscosity: 26.7 mPa s@20 deg C
Boiling Point: 261-280 deg C
Freezing/Melting Point:12 deg C
Decomposition Temperature: Not available.
Solubility: Completely soluble in water.
Specific Gravity/Density:.9820
Molecular Formula:C6H18N4
Molecular Weight:146.1528

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation, metals, excess heat.
Incompatibilities with Other Materials: Acids, acid chlorides, acid anhydrides, oxidizing agents, chloroformates.
Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide, nitrogen.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 112-24-3: YE6650000
LD50/LC50:
CAS# 112-24-3:
Draize test, rabbit, eye: 49 mg Severe;
Draize test, rabbit, eye: 20 mg/24H Moderate;
Draize test, rabbit, skin: 5 mg/24H Severe;
Oral, mouse: LD50 = 1600 mg/kg;
Oral, rabbit: LD50 = 5500 mg/kg;
Oral, rat: LD50 = 2500 mg/kg;

Skin, rabbit: LD50 = 805 mg/kg;
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Carcinogenicity:
CAS# 112-24-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: TETA contains secondary amine groups which can react with nitrosating agents to form nitrosaminse that may be carcinogenic.
Teratogenicity: Developmental abnormalities were observed in rat fetuses when doses greater than the LD50 were administered to the mother.
Reproductive Effects: Administration of doses greater than the LD50 to the mother caused reproductive effects in rat fetuses including increased rates of post-implantation mortality, stunted fetal growth, and fetal death.
Mutagenicity: Mutagenic effects including mutation, sister chromatid exchange, and unscheduled DNA synthesis were observed in laboratory experiments involving microorganisms, rat liver cells, and hamster ovaries.
Neurotoxicity: No information available.
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: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	TRIETHYLENETETRAMINE	No information available.
Hazard Class:	8	
UN Number:	UN2259	
Packing Group:	II	

Section 15 - Regulatory Information

US FEDERAL

TSCA
CAS# 112-24-3 is listed on the TSCA inventory.
Health & Safety Reporting List
None of the chemicals are on the Health & Safety Reporting List.
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
None of the chemicals in this material have an RQ.
SARA Section 302 Extremely Hazardous Substances
None of the chemicals in this product have a TPQ.
SARA Codes
CAS # 112-24-3: immediate, delayed.
Section 313 No chemicals are reportable under Section 313.
Clean Air Act:
This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.
Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances 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# 112-24-3 can be found on the following state right to know lists: New Jersey, Pennsylvania, 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:
C
Risk Phrases:
R 21 Harmful in contact with skin.
R 34 Causes burns.
R 43 May cause sensitization by skin contact.

Safety Phrases:
S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

WGK (Water Danger/Protection)
CAS# 112-24-3: 2
Canada - DSL/NDSL
CAS# 112-24-3 is listed on Canada's DSL List.
Canada - WHMIS
This product has a WHMIS classification of D2B, 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# 112-24-3 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 8/20/1998
Revision #3 Date: 10/03/2005