SAFETY DATA SHEET

TEDIA®
High Purity Solvents

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DIETHYLAMINE : TOLUENE BLEND SDS No. M0236

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Diethylamine : Toluene Blend
Synonyms: NA
Recommended Use: This product is recommended for laboratory and manufacturing use only. It is not recommended for drug, food or household use.

2. HAZARDS IDENTIFICATION

Classification:
Flammable Liquids: GHS Category 2
Acute Toxicity, Oral: GHS Category 2
Acute Toxicity, Inhalation: GHS Category 4
Acute Toxicity, Dermal: GHS Category 3
Skin Irritation: GHS Category 2
Eye Irritation: GHS Category 1
Respiratory Sensitization: GHS Category 1
Skin Sensitization: GHS Category 1
Acute Aquatic Toxicity: GHS Category 3

Label Elements
Signal Word: DANGER!
Hazard Statements:
H225 - Highly flammable liquid and vapor.
H302 – Harmful if swallowed.
H315 – Causes skin irritation.
H317 – May cause an allergic skin reaction.
H318 – Causes serious eye damage.
H332 – Harmful if inhaled.
H334 – May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H360 – May damage fertility or the unborn child.
Precautionary Statements:
P210 – Keep away from heat/sparks/open flames/hot surfaces. – No smoking.

P243 – Take precautionary measures against static discharge.
P273 – Avoid release to the environment.
P280 – Wear protective gloves/protective clothing/eye protection/face protection.
P284 – Wear respiratory protection.
P301+P310 – IF SWALLOWED: Immediately call or POISON CENTER or a doctor/physician.
P303+P361+P353 – If on skin or hair: Remove/take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P312 – IF INHALED: Call a POISON CENTER or doctor/physician if you feel unwell.

Emergency Overview
May be fatal if swallowed inhaled or absorbed through the skin. Cause burns by all routes of exposure. Aspiration hazard. May be harmful if swallowed. Can enter lungs and cause damage. May cause central nervous system effects. Possible risk to unborn children. May cause liver and kidney damage. Highly flammable liquid and vapor. Vapor may cause flash fire. Static electrical hazard. Target Organs: Cardiovascular system, central nervous system, respiratory system, liver, kidneys, eyes, and skin.

HMIS Rating:
Health – 3* Flammability – 3 Physical Hazard – 0 PPE – User supplied
NOTE: HMIS ratings use a numbering scale that ranges from 0 - 4 to indicate the degree of hazard. A value of zero means the chemical presents no hazard while a value of four indicates a high hazard. These ratings are based on the inherent properties of this chemical under expected conditions of normal use and are not intended to be used in emergency situations. PPE is determined by the user based on their needs and conditions.

3. COMPOSITION AND INFORMATION ON INGREDIENTS

Ingredient	CAS No	Percent	Hazardous
Toluene	108-88-3	80%	Yes
Diethylamine	109-89-7	20%	Yes

4. FIRST-AID MEASURES

Inhalation: If inhaled, remove to fresh air. If not breathing, begin artificial respiration, but DO NOT give mouth-to-mouth resuscitation. Get medical attention.
Ingestion: Aspiration hazard. If swallowed, get medical attention immediately; DO NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse 3outh with water.
Skin Contact: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Discard contaminated clothing and shoes.
Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.
Notes to Physician: Toluene causes cardiac sensitization to endogenous catelcholamines which may lead to cardiac arrhythmias. Do NOT use adrenergic agents such as epinephrine and pseudoepinepherne. Treat symptomatically and supportively.

5. FIRE FIGHTING MEASURES

Flammability: Highly flammable liquid and vapor (GHS Category 2)
Auto-ignition Temperature: information not available
Flash Point: -28° C (-9° F) for Diethylamine
Flammable Limits: Lower Limit – 1.1 vol %, Upper Limit – 10.1 vol % for Diethylamine
Products of Combustion: May decompose into toxic products under fire conditions (carbon monoxide, carbon dioxide, amines).
Specific Fire Hazards: As in any fire, always wear self-contained breathing apparatus in pressure-demand (MSA/NIOSH approved or equivalent), and full protective gear. Use water spray to keep fire exposed containers cool. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Vapors 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. This liquid floats on water and may travel to a source of ignition and spread the fire. Water run-off can cause environmental damage and should be collected and confined.
Fire Fighting Media: For small fires, use dry chemical, carbon dioxide, water spray, or alcohol-resistant foam. Solid streams of water may be ineffective and spread material.
National Fire Protective Association (Estimated): Health - 3, Flammability - 3, Reactivity - 0
NOTE: NFPA ratings use a numbering scale that ranges from 0 - 4 to indicate the degree of hazard. A value of zero means the chemical presents no hazard while a value of four indicates a high hazard. They are for use by emergency personnel to address the hazards that are presented by short term, acute exposure to this product under fire, spill, or similar emergencies. Ratings involve data and interpretations that may vary from company to company.

6. ACCIDENTAL RELEASE MEASURES

Absorb spilled liquid with sorbent pads, socks, or other inert material such as vermiculite, sand, or earth. Water can be used to create a non-flammable mixture. Provide ventilation to the affected area and remove all ignition sources. Approach the spill from upwind and pick up absorbed material and place it in a suitable container. Always use proper personal protective equipment as described in section 8.

7. HANDLING AND STORAGE

Precautions: Always use proper personal protective equipment as described in section 8. Wash thoroughly after handling. Ground and bond containers when transferring material. Avoid contact with eyes, skin, and clothing. Remove contaminated clothing and wash before reuse. Empty containers contain product residue (liquid and vapor) and can be dangerous. Keep container tightly closed and away from heat, spark, and flame. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks, or open flames. Use with adequate ventilation. Avoid breathing vapor or mist.
Storage: Keep in a flammables area away from all sources of ignition and oxidizing materials. Keep in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from sources of ignition. Separate from oxidizing materials.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls: Use explosion-proof ventilation equipment. Facilities storing or using the material should be equipped with eyewash station and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.
Personal Protection: Wear protective chemical goggles and face shield for eye and face protection. Use appropriate protective gloves and protective clothing to prevent skin exposure. A respiratory protection program that meets OSHA 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever possible. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.
Exposure Limits (Toluene):
ACGIH – 20 ppm TWA
NIOSH – 100 ppm TWA; 375 mg/m^3; 500 ppm IDLH
OSHA Final PELs – 200 ppm; 300 ppm Ceiling
OSHA Vacated PELs: 100 ppm TWA; 375 mg/m^3
Exposure Limits (Diethylamine):
ACGIH – 5 ppm TWA; Skin – potential significant contribution to overall exposure by cutaneous route
NIOSH – 10 ppm TWA; 30 mg/m^3 TWA; 200 ppm IDLH
OSHA Final PELs – 25 ppm TWA; 75 mg/m^3 TWA

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State and Appearance: Clear, colorless liquid.
Odor: Sweetish, pleasant odor – benzene-like odor (toluene) 0r fishy ammonia like odor (diethylamine)
Odor Threshold: 2.9 ppm for toluene, <1 ppm for diethylamine
Molecular Formula: $C_6H_5CH_3$ for toluene, $C_4H_{11}N$ for diethylamine

Molecular Weight: Mixture
Auto-ignition Temperature: Information not available.
Flash Point: -28° C (-18.4° F) for diethylamine
Flammable Limits: Lower Limit – 1.1 vol %, Upper Limit – 10.1 vol % for diethylamine
pH: Diethylamine is very alkaline.
Boiling Point: 110.6° C @ 760 mm Hg for toluene, .55-58° C @ 760 mm Hg for diethylamine
Freezing/Melting Point: -95° C for toluene, -50° C for diethylamine
Decomposition Temperature: Not available
Specific Gravity: 0.86 g/cm^3 for toluene, 0.71 g/cm^3 for diethylamine
Vapor Density (Air=1): 3.1 for toluene, 2.5 for diethylamine
Vapor Pressure: 28.4 mm Hg @ 25° C for toluene, 195 mm Hg @ 20° C for diethylamine.
Viscosity: 0.59 cP 20° C for toluene
Evaporation Rate: 2.4 for toluene
Solubility: Toluene is insoluble, diethylamine is miscible in water.
Conductivity (Toluene): Nonconductive; Conductivity = <1 pS/m; Dielectric Constant = 2.38; Relaxation Time Constant = 21 seconds
Conductivity (Diethylamine): Conductive; Conductivity = 2.2X10^5 pS/m; Dielectric Constant = NA; Relaxation Time Constant = NA

10. STABILITY AND REACTIVITY

Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Ignition sources, excess heat, confined spaces.
Incompatibility With Various Substances: Oxidizing agents, reducing agents, acids, nitric acid, sulfuric acid, dicyanofuroxan, and some metals. N-nitrosamines, many of which are known to be potent carcinogens, may be formed when this product comes in contact with nitrous acid, nitrates, or atmospheres with high nitrous oxide concentrations.
Hazardous Decomposition Products: Ammonia, nitrogen oxides, carbon monoxide, carbon dioxide, amines.
Hazardous Polymerization: Will not occur

11. TOXICOLOGICAL INFORMATION

Routes of Entry: Inhalation, skin absorption, skin contact
Acute Exposure Hazards*:*

INHALATION HAZARD: Cause burns and irritation in respiratory tract, coughing, and pulmonary edema. Animal studies with diethylamine have shown lung, liver, and heart damage from overexposure. Inhalation of high concentrations (>200 ppm) of toluene are clearly associated with central nervous system encephalopathy, headache depression, weakness, exhaustion, impaired coordination, transient memory loss, and impaired reaction time.

INGESTION HAZARD: Causes gastrointestinal tract burns May cause effects similar to those for inhalation. May cause central nervous system depression. Aspiration into lungs may cause chemical pneumonitis, which may be fatal. May be harmful if swallowed.

SKIN CONTACT HAZARD: Causes skin burns and irritation. May be absorbed through intact skin. Repeated or prolonged exposure may cause drying and cracking of skin.

EYE CONTACT HAZARD: Causes eye burns. Vapor may cause eye irritation.

Chronic Exposure Hazards: Chronic effects to diethylamine exposure may be similar to acute effects. Repeated or prolonged exposure to toluene may cause dermatitis and defatting of skin. Repeated exposure in combination with constant, loud noise can produce hearing loss and dizziness. Chronic hydrocarbon abuse, such as sniffing glue or light hydrocarbons as contained in this material, has been associated with irregular hear rhythms and potential cardiac arrest. Toluene abuse has been linked with kidney disease, as evidenced by blood, protein, and pus in the urine, accompanied by elevated serum creatinine, decreased urinary output, and metabolic and renal tubular acidosis. Although kidney toxicity is not common in cases of occupational toluene exposure, there has been at least one report of renal toxicity following a 40-year occupational exposure to toluene. Toluene does not cause severe bone marrow injury characteristic to benzene poisoning. Intentional abuse of toluene vapors has been linked to damage to the brain, liver, and kidneys, as well as to death. Repeated inhalation exposure to animals causes histological changes in the brain, degeneration of heart tissue, and

possible immune system effects.
Animal Toxicity (Toluene):
Draize test, rabbit, eye: 870 ug Mild;
Draize test, rabbit, eye: 2 mg/24H Severe;
Draize test, rabbit, skin: 435 mg Mild;
Draize test, rabbit, skin: 500 mg Moderate;
Draize test, rabbit, skin: 20 mg/24 hr Moderate;
Inhalation, mouse: LC50 = 400 ppm/42H;
Inhalation, mouse: LC50 = 30,000 mg/m^3/2H;
Inhalation, mouse: LC50 = 19,900 mg/m^3/7H;
Inhalation, mouse: LC50 = 10,000 mg/m^3;
Inhalation, rat: LC50 = 49 mg/m^3/4H;
Oral, rat: LD50 = 636 mg/kg;
Skin, rabbit: LD50 = 14,100 mg/kg;
Animal Toxicity (Diethylamine):
Inhalation, rat: LC50 = 4000 ppm/4H;
Oral, mouse: LD50 = 500 mg/kg;
Oral, rat: LD50 = 540 mg/kg;
Skin, rabbit: LD50 = 820 uL/kg;
Carcinogenicity: Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65
Epidemiology: No information found.
Teratogenicity: (Toluene) In an epidemiological study of toluene and pregnancy, occupational exposures to toluene were said to be associated with an increased incidence of renal, urinary, gastrointestinal, and cardiac anomalies. Reduced fetal weight, effects on learning and memory, and hearing loss in males were observed in the of-spring of rats exposed by inhalation at levels that did not cause toxic affects in the mother. (Diethylamine) Edema of the epithelium of the cornea, generally without pain, has been produced by amine vapors, causing colored halos to be seen around lights, usually in the evening, after industrial exposure to the vapors of various amines.
Reproductive Effects: Many reports of reproductive effects of toluene abuse or heavy occupational exposure are confounded by mixed solvent exposure or fetal alcohol syndrome. In women exposed to toluene in lab work, the risk of spontaneous abortion increased 4.7 times.
Mutagenicity: No information available.
Neurotoxicity: No information available.

12. ECOLOGICAL INFORMATION

Ecotoxicity for Toluene:
Bluegill: LC50 = 17 mg/L/24H;
Shrimp: LC50 = 4.3 ppm/96H;
Fathead minnow: LC50 = 36.2 mg/L/96H;
Sunfish (Fresh water): TLm = 1180 mg/L/96H;
Environmental Fat for Toluene: When released to soil, product is expected to evaporate and be microbially biodegraded. In water, product is expected to biodegrade and volatilize. Photochemically produced hydroxyl radicals degrade this material.
Ecotoxicity for Diethylamine:
Fish: Rainbow Trout: LC50 = 25-198 mg/L, 96H
Water flea: Daphnia: EC50 = 56 mg/L, 48H
Algae: Green Algae: EC50 = 20 mg/L, 96H
Environmental Fate for Diethylamine:
Readily biodegradable. An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

13. DISPOSAL CONSIDERATIONS

Material that cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Processing, use or contamination of this product may change the waste management options. Waste generators must

decide if discarded material is a hazardous waste. State and local disposal regulations may differ from federal disposal definitions found in 40 CFR 261.3. Dispose of container and unused contents in accordance with federal, state and local requirements. Toluene is a "U" listed waste (U220).

14. TRANSPORT INFORMATION

US DOT
Proper Shipping Name: Flammable Liquid, Corrosive, n.o.s. (Toluene, Diethylamine)
Hazard Class: 3(8)
UN Number: UN2924
Packing Group: II

IDMG
Proper Shipping Name: Flammable Liquid, Corrosive, n.o.s. (Toluene, Diethylamine)
Hazard Class: 3(8)
UN Number: UN2924
Packing Group: II

IATA
Proper Shipping Name: Flammable Liquid, Corrosive, n.o.s. (Toluene, Diethylamine)
Hazard Class: 3(8)
UN Number: UN2924
Packing Group: II

15. REGULATORY INFORMATION

US Federal Regulations:
CERCLA Hazardous Substances: CAS# 108-88-3 – 1000 lb final RQ; 454 kg final RQ; CAS#109-89-7 – 100 lb final RQ; 45.4 kg final RQ
SARA Codes: CAS# 108-88-3 – immediate, fire; CAS#109-89-7 – immediate, delayed, fire
Section 313: Toluene (CAS# 108-88-3) is subject to SARA Title III Section 313 and 40 CFR 373 reporting requirements.
Clean Air Act: CAS# 108-88-3 is listed as a hazardous air pollutant.
Clean Water Act: CAS# 108-88-3 and CAS# 109-89-7 are listed as a Hazardous Substances. CAS# 108-88-3 is a Priority Pollutant. CAS# 108-88-3 is a Toxic Pollutant.
OSHA: Not considered highly hazardous by OSHA.

US State Regulations:
CAS# 108-88-3 and CAS#109-89-7 are on the following state right-to-know lists: California, New Jersey, Pennsylvania, Minnesota, and Massachusetts

16. OTHER INFORMATION

Originally Prepared: 6/18/2008
Last Revised: 12/1/2015 – Updated information for eye and face protection in Section 8.

The information contained herein is based on current knowledge and experience; no responsibility is accepted that the information is sufficient or correct in all cases. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers and the protection of the environment.

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