



Safety Data Sheet

1. PRODUCT IDENTIFICATION

Name	Diethylenetriamine (DETA)
Synonyms others	N-(2-aminoethyl)-1,2-ethanediamine; 2,2'-iminobisethylamine; N-(2-aminoethyl)ethylenediamine &
CAS#	111-40-0
Europe EC#	203-865-4
Product Uses	mfg. of chelating agents, surfactants, resins, corrosion inhibitors, epoxy polymerising agent, etc

2. HAZARDS

Quick Guide: corrosive to skin, eyes & respiratory tract, skin sensitizer; forms toxic substances in fire

Canada – WHMIS
Key:

D 2B, E
B 2 – Flash Point <38°C, B 3 – Flash Point >38°C & <93°C
D 1 – Immediately Toxic, D 2 – Chronic Toxicity
C – Oxidising Substance, E – Corrosive, F – Reactive Substance



U.S.A. – HMIS
Key:

Health – 3, Fire – 1, Reactivity – 0
0=minimal, 1=slight, 2=moderate, 3=serious, 4=severe



3. COMPOSITION

	%	TWAEV / TLV mg/m ³	LD ₅₀ (mg/kg) ORAL	LD ₅₀ (mg/kg) SKIN	LC ₅₀ ppm INHALATION
Diethylenetriamine	100%	1 / 4 (skin)	>600	>670	7.6*

* see NOTE, Part 11

4. FIRST AID

SKIN:	Wash with plenty of water. Remove contaminated clothing and do not reuse until thoroughly laundered.
EYES:	Wash eyes with plenty of water, holding eyelids open. Seek medical assistance promptly if there is irritation.
INHALATION:	Remove from contaminated area promptly. CAUTION: Rescuer must not endanger himself! If breathing stops, administer artificial respiration and seek medical aid promptly.
INGESTION:	Give plenty of water to dilute product. Do not induce vomiting (NOTE below). Keep victim quiet. If vomiting occurs, lower victim's head below hips to prevent inhalation of vomited material. Seek medical help promptly.

Inadvertent inhalation of vomited material may seriously damage the lungs. The danger of this is greater than the risk of poisoning through absorption of this relatively low-toxicity substance. The stomach should only be emptied under medical supervision, and after the installation of an airway to protect the lungs.

5. FIRE FIGHTING & FLAMMABILITY

Flash Point	94°C / 202°F (closed cup) – also 98°C / 208°F (open cup)
Autoignition Temperature	358°C / 676°F
Flammable Limits	2% – 6.7%
Combustion Products	carbon monoxide, nitrogen oxides, hydrogen cyanide, ammonia
Firefighting Precautions	alcohol foam, dry chemical, water fog or spray; firefighters must wear SCBA
Static Discharge	cannot accumulate a static charge

Please ensure that this MSDS is given to, and explained to people using this product.

6. ACCIDENTAL RELEASE MEASURES

Leak Precaution dyke to control spillage and prevent environmental contamination
 Handling Spill ventilate contaminated area; recover free liquid with suitable pumps; absorb residue on an inert inorganic* sorbent, sweep, shovel & store in closed containers for recycling or disposal

* **NOTE:** DOW Chemical recommends: "Avoid using organic absorbents such as ground corn cobs, sawdust, cellulose or peat moss" for spilled DETA.

7. HANDLING & STORAGE

Store and use in a cool, dry environment, away from substances named in Part X. Do not use pressurised air or inert gas to transfer product.

Never cut, drill, weld or grind on or near this container, whether empty or full. Always replace drum, pail or IBC cap prior to moving the container!

Avoid breathing product vapour. Use with adequate ventilation to maintain airborne concentration of the product below the TLV (see Part 8). If dealing with a spill, & ventilation is impractical, wear a suitable respirator with organic vapour & alkaline gas cartridge. Avoid all contact with skin & wash work clothes frequently. An eye bath & safety shower must be available near the workplace.

Note that the reaction between diethylenetriamine & nitrites or nitrous acid may produce nitroso compounds, some of which are known carcinogens.

8. EXPOSURE CONTROL & PERSONAL PROTECTION

Ontario TWAEV	1ppm / 4mg/m ³ (skin)	Ontario STEV	not listed
ACGIH TLV	1ppm / 4.2mg/m ³ (skin)		
OSHA PEL	1ppm / 4.2mg/m ³ (skin)		
Ventilation	mechanical ventilation may be required to control airborne vapour or mist to regulated limits; a respirator with organic vapour cartridge should be available for escape purposes, should ventilation fail (<i>always store respirator in an airtight container [eg: "Tupperware"] to maintain cartridge "freshness"</i>)		
Hands	butyl, neoprene or "Viton" gloves – <i>always confirm suitability with supplier</i>		
Eyes	safety glasses with side shields and a face shield – <i>always protect eyes!</i>		
Clothing	impermeable (hands, above) apron, boots, hat, long sleeves, if splashing is possible; if splashing is likely, wear a suitable complete protective chemical-resistant suit		

9. PHYSICAL PROPERTIES

Odour & Appearance	clear, slightly viscous, colourless to yellowish, hygroscopic liquid with pungent odour
Odour Threshold	not known
Vapour Pressure	0.37mmHg / 0.049kPa (20°C/ 68°F)
Evaporation Rate (<i>Butyl Acetate = 1</i>)	0.01 – <i>not readily volatile</i>
Vapour Density (air = 1)	3.6
Boiling Point	207°C / 405°F
Freezing Point	-39°C / -38°F
Specific Gravity	0.955 (20/20°C)
Water Solubility	complete
- in other solvents	in most organic solvents; limited solubility in aliphatic hydrocarbons
Viscosity	7.1centipoise (20°C / 68°F)
pH	12 (100 grams DETA/litre)
Conversion Factor	1ppm = 4.21mg/m ³
Molecular Weight	103

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10. REACTIVITY

Dangerously Reactive With	strong oxidising agents, strong acids, halogenated compounds, nitromethane & similar nitrogenated organic compounds
Also Reactive With	silver, cobalt, chromium sodium hypochlorite & calcium hypochlorite form explosive compounds; may form carcinogenic nitroso compounds with nitrites & nitrous acid; corrodes copper & its alloys but not aluminum; reacts with acrylates, alcohols & aldehydes; <i>Do not use organic sorbent materials like ground corn cobs, peat moss or sawdust on spill.</i>
Chemical Stability	stable; will not polymerize
Decomposes in Presence of	atmospheric CO ₂
Decomposition Products	apart from combustion products, DETA reacts to form carbamates with atmospheric CO ₂
Mechanical Impact	not sensitive

11. TOXICITY**Effects, Acute Exposure**

Skin Contact	corrosive to skin if not rinsed promptly causing inflammation, blistering, ulceration and permanent scarring; vapour or mist of sufficient concentration may cause irritation to skin
Skin Absorption	yes, slowly; toxic effects unlikely, but possible <i>if exposure is extensive</i> by this route
Eye Contact	liquid & vapour severely irritating & likely to damage eyes; an early symptom of amine vapour or mist is a “blue haze” appearing around bright objects – <i>temporary, clears in several hours</i>
Inhalation	irritating to nose & throat; coughing, chest pain, shortness of breath, difficult breathing <i>Low vapour pressure reduces the likelihood of eye or lung irritation due to airborne vapour.</i>
Ingestion	burning sensation in mouth, throat, stomach; nausea, vomiting, diarrhoea, thirst, weakness, shock, collapse and eventual death – <i>not a route of industrial exposure</i>

Effects, Chronic Exposure

General	severe acute effects make prolonged or repeated exposure of skin unlikely; respiratory difficulty may occur following repeated inhalation
Sensitising	skin sensitiser; possible respiratory sensitiser
Carcinogen/Tumorigen	not known to be a tumorigen or a carcinogen in humans or animals
Reproductive Effect	no known effect on humans or animals
Mutagen	not known to be a mutagen or teratogen in humans or animals
Synergistic With	may form carcinogenic nitrosamines with nitrites or nitrous acid
LD ₅₀ (oral)	820 to 2600mg/kg (rat), 600mg/kg (guinea pig)
LD ₅₀ (skin)	670 to 1240mg/kg (rabbit), 160mg/kg (guinea pig – <i>4 day application</i>)
LC ₉₀ (inhalation)	7.6ppm (rat) – NOTE: <i>An LD₉₀; 9 of 10 animals died at this dose; the laboratory & result, may not be reliable</i>

12. ECOLOGICAL INFORMATION

Bioaccumulation	readily metabolised (96% eliminated in 48hr) and will not bioaccumulate
Biodegradation	biodegrades not at all in some tests; if the biological reactor is “acclimated” to petrochemical effluent, the rate rises to 55% in 10 dy, 70% in 20dy, 70% in 28dy, 80-90% in 30dy <i>Considered readily biodegradable in acclimated facility.</i>
Abiotic Degradation	reacts rapidly with atmospheric hydroxyl (OH) radicals; estimated ½-life in air is 2.7hr
Mobility in soil, water	water soluble; moves readily through soil and the water column
Aquatic Toxicity	
LC ₅₀ (Fish 96 hr)	430mg/litre (Leuciscus idus), 248, 332 & 1014mg/litre (Poecilia reticulata)
LC ₅₀ (Crustacea, 24hr)	710mg/litre (Artemia salina), 37mg/litre (Daphnia magna)
LC ₅₀ (Crustacea, 48hr)	17, 54 & 65mg/litre (Daphnia magna)
EC ₅₀ (Algae, 96hr)	592mg/litre (Scenedesmus subspicatus), 1164mg/litre (Selenastrum capricornutum)
LC ₅₀ (Microorganisms)	96 & 2000mg/litre (Pseudomonas putida), 32.7mg/litre (“nitrifying bacteria”)

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13. DISPOSAL

Waste Disposal **do not flush to sewer**; may be incinerated in approved facility with flue gas monitoring & scrubbing after mixing with a suitable flammable hydrocarbon waste

Containers **Drums** should be reused. Recondition and pressure test by a licensed reconditioner prior to re-use.
Pails must be vented and thoroughly dried prior to crushing and recycling.
IBCs (intermediate bulk containers): polyethylene bottle must be pressure tested & recertified at 30 months. Replace at 60 months (5yrs). Steel containers must be inspected, pressure tested & recertified every 5 years.
Never cut, drill, weld or grind on or near this container, even if empty

14. TRANSPORT CLASSIFICATION

Canada TDG	PIN	UN- 2079
AND	Shipping Name	diethylenetri.amine
U.S.A. 49 CFR	Class	8
	Packing Group	II
Marine Pollutant		not a marine pollutant
ERAP Required		NO

EMERGENCY INFORMATION

Canada	Call CANUTEC (collect)	(613) 996-6666
U.S.A.	Call CHEMTREC	(800) 424-9300

15. REGULATIONS

Canada DSL	on inventory
U.S.A. TSCA	on inventory
Europe EINECS	on inventory
Europe Classification	Corrosive
Europe Risk Phrases	R: 21/22, 34, 43 -
Europe Safety Phrases	S: 26, 36/37/39, 45 -

16. OTHER INFORMATION

Prepared for Megaloid Laboratories by Peter Bursztyn, (705) 734-1577
 Data from RTECS, HSDB (Haz. Substance Data Base), Cheminfo (CCOHS), IUCLID Datasheets (ESIS – European Chem. Substance Info. System), & others.
 Preparation Date: **December 2003** Revision Date: **December 2006, December 2009, November 2012**

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