2-DIETHYLAMINOETHANOL

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
DIETHYLAMINOETHANOL

OTHER NAMES
(CH3-CH2)2-N-CH2-CH2-OH, (CH3-CH2)2-N-CH2-CH2-OH, C6-H15-N-O, C6-H15-N-O, 2-diethylaminoethanol, 2-diethylaminoethanol, beta-diethylaminoethanol, N-diethylaminoethanol, N-diethylaminoethanol, 2-(diethylamino)ethanol, 2-(diethylamino)ethanol, 2-N-diethylaminoethanol, 2-N-diethylaminoethanol, "beta-diethylaminoethyl alcohol",

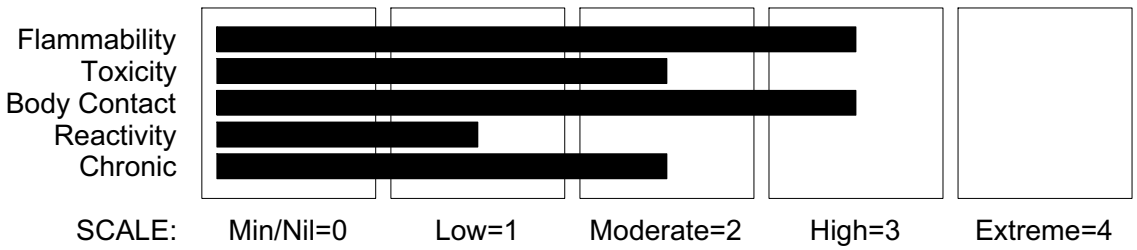
PROPER SHIPPING NAME
2-DIETHYLAMINOETHANOL

PRODUCT USE
Water-soluble salts, fatty acid derivatives used as textile softeners, pharmaceuticals, antirust compositions, emulsifying agents in acid media. Derivatives containing tertiary amine groups are epoxy resin curing agents.

SUPPLIER
Company: S D FINE - CHEM LIMITED
Address:
315- 317, T.V.IND.ESTATE,
248 WORLI ROAD,
MUMBAI- 400 030, INDIA
technical@sdfine.com
Telephone: 91- 22 24959898
Telephone: 91- 22 24959899
Fax: 91- 22 24937232

Section 2 - HAZARDS IDENTIFICATION

CHEMWATCH HAZARD RATINGS



GHS Classification

Acute Toxicity (Dermal) Category 3

continued...

Acute Toxicity (Inhalation) Category 4
Acute Toxicity (Oral) Category 4
Flammable Liquid Category 3
Metal Corrosion Category 1
Serious Eye Damage Category 1
Skin Corrosion/Irritation Category 1B
Skin Sensitizer Category 1

EMERGENCY OVERVIEW

HAZARD
DANGER
Determined by using GHS criteria:
H226 H311 H302 H332 H317 H290 H314 H318
Flammable liquid and vapour
Toxic in contact with skin
Harmful if swallowed
Harmful if inhaled
May cause allergic skin reaction
May be corrosive to metals
Causes severe skin burns and eye damage
Causes serious eye damage

PRECAUTIONARY STATEMENTS

Prevention
Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Keep container tightly closed.
Keep only in original container.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ventilating/lighting equipment
Use only non-sparking tools.
Take precautionary measures against static discharge.
Do not breathe dust/fume/gas/mist/vapours/spray.
Avoid breathing dust/fume/gas/mist/vapours/spray.
Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.
Use only outdoors or in a well-ventilated area.
Contaminated work clothing should not be allowed out of the workplace.
Wear protective gloves/protective clothing/eye protection/face protection.

Response
IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
IF ON SKIN: Wash with plenty of soap and water.
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

continued...

Immediately call a POISON CENTER or doctor/physician.
Call a POISON CENTER or doctor/physician if you feel unwell.
Rinse mouth.
If skin irritation or rash occurs: Get medical advice/attention.
Remove/Take off immediately all contaminated clothing.
Wash contaminated clothing before reuse.
Absorb spillage to prevent material damage.

Storage
Store in a well-ventilated place. Keep cool.
Store locked up.
Store in corrosive resistant container or with a resistant inner liner.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
diethylaminoethanol	100-37-8	>99

Section 4 - FIRST AID MEASURES

SWALLOWED
- If swallowed do NOT induce vomiting.
- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- Observe the patient carefully.
- Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
- Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
- Seek medical advice.
- Avoid giving milk or oils.
- Avoid giving alcohol.
- If spontaneous vomiting appears imminent or occurs, hold patient's head down, lower than their hips to help avoid possible aspiration of vomitus.

EYE
■ If this product comes in contact with the eyes:
- Immediately hold eyelids apart and flush the eye continuously with running water.
- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.
- Transport to hospital or doctor without delay.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN
■ If skin contact occurs:
- Immediately remove all contaminated clothing, including footwear.
- Flush skin and hair with running water (and soap if available).
- Seek medical attention in event of irritation.

INHALED
- If fumes or combustion products are inhaled remove from contaminated area.
- Lay patient down. Keep warm and rested.

continued...

Section 4 - FIRST AID MEASURES

• Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
• Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
• Transport to hospital, or doctor, without delay.
• Inhalation of vapours or aerosols (mists, fumes) may cause lung oedema.
• Corrosive substances may cause lung damage (e.g. lung oedema, fluid in the lungs).
• As this reaction may be delayed up to 24 hours after exposure, affected individuals need complete rest (preferably in semi-recumbent posture) and must be kept under medical observation even if no symptoms are (yet) manifested.
• Before any such manifestation, the administration of a spray containing a dexamethasone derivative or beclomethasone derivative may be considered.
This must definitely be left to a doctor or person authorised by him/her.
(ICSC13719).

NOTES TO PHYSICIAN
■ For acute or short-term repeated exposures to highly alkaline materials:
• Respiratory stress is uncommon but present occasionally because of soft tissue edema.
• Unless endotracheal intubation can be accomplished under direct vision, cricothyroidotomy or tracheotomy may be necessary.
• Oxygen is given as indicated.
• The presence of shock suggests perforation and mandates an intravenous line and fluid administration.
• Damage due to alkaline corrosives occurs by liquefaction necrosis whereby the saponification of fats and solubilisation of proteins allow deep penetration into the tissue.
Alkalis continue to cause damage after exposure.
INGESTION:
• Milk and water are the preferred diluents
No more than 2 glasses of water should be given to an adult.
• Neutralising agents should never be given since exothermic heat reaction may compound injury.
* Catharsis and emesis are absolutely contra-indicated.
* Activated charcoal does not absorb alkali.
* Gastric lavage should not be used.
Supportive care involves the following:
• Withhold oral feedings initially.
• If endoscopy confirms transmucosal injury start steroids only within the first 48 hours.
• Carefully evaluate the amount of tissue necrosis before assessing the need for surgical intervention.
• Patients should be instructed to seek medical attention whenever they develop difficulty in swallowing (dysphagia).
SKIN AND EYE:
• Injury should be irrigated for 20-30 minutes.
Eye injuries require saline. [Ellenhorn & Barceloux: Medical Toxicology].

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA
• Water spray or fog.
• Foam.
• Dry chemical powder.
• BCF (where regulations permit).
• Carbon dioxide.

FIRE FIGHTING
• Alert Fire Brigade and tell them location and nature of hazard.
• May be violently or explosively reactive.
• Wear breathing apparatus plus protective gloves.
• Prevent, by any means available, spillage from entering drains or water course.

continued...

Section 5 - FIRE FIGHTING MEASURES

• If safe, switch off electrical equipment until vapour fire hazard removed.
• Use water delivered as a fine spray to control fire and cool adjacent area.
• Avoid spraying water onto liquid pools.
• DO NOT approach containers suspected to be hot.
• Cool fire exposed containers with water spray from a protected location.
• If safe to do so, remove containers from path of fire.

FIRE/EXPLOSION HAZARD
• Liquid and vapour are flammable.
• Moderate fire hazard when exposed to heat or flame.
• Vapour forms an explosive mixture with air.
• Moderate explosion hazard when exposed to heat or flame.
• Vapour may travel a considerable distance to source of ignition.
• Heating may cause expansion or decomposition leading to violent rupture of containers.
• On combustion, may emit toxic fumes of carbon monoxide (CO).
Combustion products include: carbon dioxide (CO_2), carbon monoxide (CO), nitrogen oxides (NOx), other pyrolysis products typical of burning organic material.
May emit corrosive fumes.

FIRE INCOMPATIBILITY
• Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result.

Personal Protective Equipment
Gas tight chemical resistant suit.

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS
• Remove all ignition sources.
• Clean up all spills immediately.
• Avoid breathing vapours and contact with skin and eyes.
• Control personal contact by using protective equipment.
• Contain and absorb small quantities with vermiculite or other absorbent material.
• Wipe up.
• Collect residues in a flammable waste container.
• Drains for storage or use areas should have retention basins for pH adjustments and dilution of spills before discharge or disposal of material.
• Check regularly for spills and leaks.

MAJOR SPILLS
■ Chemical Class: bases
For release onto land: recommended sorbents listed in order of priority.

SORBENT TYPE	RANK	APPLICATION	COLLECTION	LIMITATIONS
LAND SPILL - SMALL				
cross- linked polymer - particulate	1	shovel	shovel	R, W, SS

continued...

cross- linked polymer - pillow	1	throw	pitchfork	R, DGC, RT
sorbent clay - particulate	2	shovel	shovel	R, I, P
foamed glass - pillow	2	throw	pitchfork	R, P, DGC, RT
expanded minerals - particulate	3	shovel	shovel	R, I, W, P, DGC
foamed glass - particulate	4	shovel	shovel	R, W, P, DGC,

LAND SPILL - MEDIUM

cross- linked polymer - particulate	1	blower	skiploader	R, W, SS
sorbent clay - particulate	2	blower	skiploader	R, I, P
expanded mineral - particulate	3	blower	skiploader	R, I, W, P, DGC
cross- linked polymer - pillow	3	throw	skiploader	R, DGC, RT
foamed glass - particulate	4	blower	skiploader	R, W, P, DGC
foamed glass - pillow	4	throw	skiploader	R, P, DGC., RT

Legend
DGC: Not effective where ground cover is dense
R; Not reusable
I: Not incinerable
P: Effectiveness reduced when rainy
RT:Not effective where terrain is rugged
SS: Not for use within environmentally sensitive sites
W: Effectiveness reduced when windy
Reference: Sorbents for Liquid Hazardous Substance Cleanup and Control;
R.W Melvold et al: Pollution Technology Review No. 150: Noyes Data Corporation 1988.

- Clear area of personnel and move upwind.
- Alert Fire Brigade and tell them location and nature of hazard.
- May be violently or explosively reactive.
- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water course.
- No smoking, naked lights or ignition sources.
- Increase ventilation.
- Stop leak if safe to do so.
- Water spray or fog may be used to disperse / absorb vapour.
- Contain spill with sand, earth or vermiculite.
- Use only spark-free shovels and explosion proof equipment.
- Collect recoverable product into labelled containers for recycling.
- Absorb remaining product with sand, earth or vermiculite.
- Collect solid residues and seal in labelled drums for disposal.
- Wash area and prevent runoff into drains.
- If contamination of drains or waterways occurs, advise emergency services.

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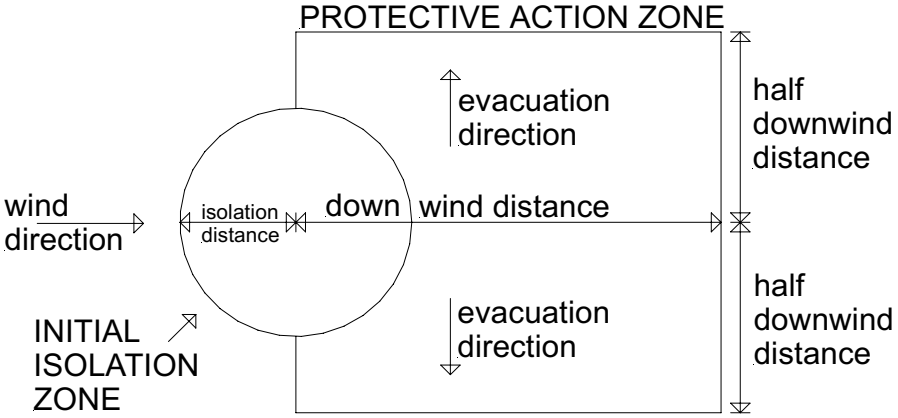
PROTECTIVE ACTIONS FOR SPILL



From IERG (Canada/Australia)

Isolation Distance	50 metres
Downwind Protection Distance	300 metres
IERG Number	18

FOOTNOTES

1 PROTECTIVE ACTION ZONE is defined as the area in which people are at risk of harmful exposure. This zone assumes that random changes in wind direction confines the vapour plume to an area within 30 degrees on either side of the predominant wind direction, resulting in a crosswind protective action distance equal to the downwind protective action distance.

2 PROTECTIVE ACTIONS should be initiated to the extent possible, beginning with those closest to the spill and working away from the site in the downwind direction. Within the protective action zone a level of vapour concentration may exist resulting in nearly all unprotected persons becoming incapacitated and unable to take protective action and/or incurring serious or irreversible health effects.

3 INITIAL ISOLATION ZONE is determined as an area, including upwind of the incident, within which a high probability of localised wind reversal may expose nearly all persons without appropriate protection to life-threatening concentrations of the material.

4 SMALL SPILLS involve a leaking package of 200 litres (55 US gallons) or less, such as a drum (jerrican or box with inner containers). Larger packages leaking less than 200 litres and compressed gas leaking from a small cylinder are also considered "small spills".

LARGE SPILLS involve many small leaking packages or a leaking package of greater than 200 litres, such as a cargo tank, portable tank or a "one-tonne" compressed gas cylinder.

5 Guide 132 is taken from the US DOT emergency response guide book.

6 IERG information is derived from CANUTEC - Transport Canada.

Personal Protective Equipment advice is contained in Section 8 of the MSDS.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

■ Alkanolamines and iron may produced unstable complexes. Monoethanolamine (MEA) and iron form a trisethanolamino-iron complex. This material may spontaneously decompose at temperatures between 130 and 160 degrees C. and is suspected of causing a fire in a nearly empty storage tank containing a "heel" of MEA in contact with carbon steel coils. If steam coil heating is used, low pressure steam in stainless steel coils should be considered. Drum heating should also be reviewed and, where possible, temperatures should be maintained below 130 degrees C.

• DO NOT USE brass or copper containers / stirrers.
• DO NOT allow clothing wet with material to stay in contact with skin.
• Avoid all personal contact, including inhalation.
• Wear protective clothing when risk of exposure occurs.
• Use in a well-ventilated area.

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• WARNING: To avoid violent reaction, ALWAYS add material to water and NEVER water to material.
• Avoid smoking, naked lights or ignition sources.
• Avoid contact with incompatible materials.
• When handling, DO NOT eat, drink or smoke.
• Keep containers securely sealed when not in use.
• Avoid physical damage to containers.
• Always wash hands with soap and water after handling.
• Work clothes should be laundered separately. Launder contaminated clothing before re-use.
• Use good occupational work practice.
• Observe manufacturer's storing and handling recommendations.
• Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.
• Containers, even those that have been emptied, may contain explosive vapours.
• Do NOT cut, drill, grind, weld or perform similar operations on or near containers.

SUITABLE CONTAINER
• Lined metal can, lined metal pail/ can.
• Plastic pail.
• Polyliner drum.
• Packing as recommended by manufacturer.
• Check all containers are clearly labelled and free from leaks.
For low viscosity materials
• Drums and jerricans must be of the non-removable head type.
• Where a can is to be used as an inner package, the can must have a screwed enclosure.
For materials with a viscosity of at least 2680 cSt. (23 deg. C) and solids (between 15 C deg. and 40 deg C.):
• Removable head packaging;
• Cans with friction closures and
• low pressure tubes and cartridges
may be used.
-
Where combination packages are used, and the inner packages are of glass, porcelain or stoneware, there must be sufficient inert cushioning material in contact with inner and outer packages unless the outer packaging is a close fitting moulded plastic box and the substances are not incompatible with the plastic.

STORAGE INCOMPATIBILITY
■ Diethylaminoethanol:
• reacts violently with oxidisers, strong acids, acid anhydrides
• reacts with light metals, aluminium, beryllium, magnesium, alkali metals
• attacks some rubbers and plastics.
• Avoid strong acids, acid chlorides, acid anhydrides and chloroformates.
• Avoid contact with copper, aluminium and their alloys.
• Avoid reaction with oxidising agents.

STORAGE REQUIREMENTS
• Store in approved flammable liquid storage area.
• No smoking, naked lights/ignition sources.
• Keep containers securely sealed.
• Store away from incompatible materials in a cool, dry, well-ventilated area.
• Protect containers against physical damage and check regularly for leaks.
• Storage areas should be clearly identified, well illuminated, clear of obstruction and accessible only to trained and authorised personnel - adequate security must be provided so that unauthorised personnel do not have access.
• Store in grounded, properly designed and approved vessels and away from incompatible materials
• Store according to applicable regulations for flammable materials for storage tanks, containers, piping, buildings, rooms, cabinets, allowable quantities and minimum storage distances.
• Use non-sparking ventilation systems, approved explosion proof equipment and intrinsically safe electrical systems.

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- Have appropriate extinguishing capability in storage area (e.g. portable fire extinguishers - dry chemical, foam or carbon dioxide) and flammable gas detectors.
- Keep adsorbents for leaks and spills readily available
- For bulk storages, consider use of floating roof or nitrogen blanketed vessels; where venting to atmosphere is possible, equip storage tank vents with flame arrestors; inspect tank vents during winter conditions for vapour/ ice build-up; storage tanks should be above ground and diked to hold entire contents
- Observe manufacturer's storing and handling recommendations.
- DO NOT store near acids, or oxidising agents.

SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS

+	+	+	+	X	+

+: May be stored together
O: May be stored together with specific preventions
X: Must not be stored together

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m³	Notes
Australia Exposure Standards	diethylaminoethanol (2-Diethylaminoethanol (h))	10	48	Sk

EMERGENCY EXPOSURE LIMITS

Material	Revised IDLH Value (mg/m3)	Revised IDLH Value (ppm)
diethylaminoethanol		100

MATERIAL DATA

DIETHYLAMINOETHANOL:

■ For diethylaminoethanol:

Odour Threshold Value: 0.011 ppm (detection), 0.040 ppm (recognition)

The TLV-TWA is thought to be protective against irritation and sensitisation.

Odour Safety Factor(OSF)

OSF=1.8E2 (2-DIETHYLAMINOETHANOL).

Exposed individuals are reasonably expected to be warned, by smell, that the Exposure Standard is being exceeded.

Odour Safety Factor (OSF) is determined to fall into either Class A or B.

The Odour Safety Factor (OSF) is defined as:

OSF= Exposure Standard (TWA) ppm/ Odour Threshold Value (OTV) ppm

Classification into classes follows:

Class	OSF	Description
A	550	Over 90% of exposed individuals are aware by smell that the Exposure Standard (TLV- TWA for example) is being reached, even when distracted by working activities

continued...

B	26- 550	As " A" for 50- 90% of persons being distracted
C	1- 26	As " A" for less than 50% of persons being distracted
D	0.18- 1	10- 50% of persons aware of being tested perceive by smell that the Exposure Standard is being reached
E	<0.18	As " D" for less than 10% of persons aware of being tested

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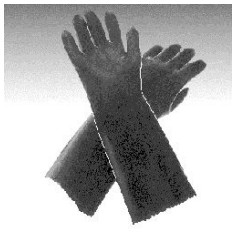
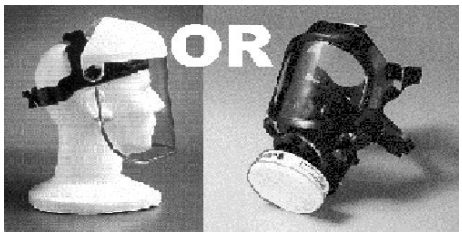
PERSONAL PROTECTION



EYE
- Safety glasses with side shields.
- Chemical goggles.
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59].

HANDS/FEET
- Wear chemical protective gloves, eg. PVC.
- Wear safety footwear or safety gumboots, eg. Rubber.

NOTE:
- The material may produce skin sensitisation in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact.
- Contaminated leather items, such as shoes, belts and watch-bands should be removed and destroyed.

Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include: such as:
- frequency and duration of contact,
- chemical resistance of glove material,
- glove thickness and
- dexterity

Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739).
- When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374) is recommended.
- When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374) is recommended.
- Contaminated gloves should be replaced.

Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.

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OTHER
• Overalls.
• PVC Apron.
• PVC protective suit may be required if exposure severe.
• Eyewash unit.
• Ensure there is ready access to a safety shower.
• Some plastic personal protective equipment (PPE) (e.g. gloves, aprons, overshoes) are not recommended as they may produce static electricity.
• For large scale or continuous use wear tight-weave non-static clothing (no metallic fasteners, cuffs or pockets), non sparking safety footwear.

GLOVE SELECTION INDEX
■ Glove selection is based on a modified presentation of the:
" Forsberg Clothing Performance Index" .
The effect(s) of the following substance(s) are taken into account in the computer- generated selection: diethylaminoethanol

■ Protective Material

BUTYL	A
NITRILE	A
PVA	A
VITON	A

A: Best Selection
B: Satisfactory; may degrade after 4 hours continuous immersion
C: Poor to Dangerous Choice for other than short term immersion

NOTE: As a series of factors will influence the actual performance of the glove, a final selection must be based on detailed observation. -

* Where the glove is to be used on a short term, casual or infrequent basis, factors such as "feel" or convenience (e.g. disposability), may dictate a choice of gloves which might otherwise be unsuitable following long-term or frequent use. A qualified practitioner should be consulted.

RESPIRATOR
■ Selection of the Class and Type of respirator will depend upon the level of breathing zone contaminant and the chemical nature of the contaminant. Protection Factors (defined as the ratio of contaminant outside and inside the mask) may also be important.

Breathing Zone Level ppm (volume)	Maximum Protection Factor	Half- face Respirator	Full- Face Respirator
1000	10	AK- AUS	-
1000	50	-	AK- AUS
5000	50	Airline *	-
5000	100	-	AK- 2
10000	100	-	AK- 3
	100+		Airline**

* - Continuous Flow ** - Continuous-flow or positive pressure demand.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required. For further information consult your

continued...

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational Health and Safety Advisor.

ENGINEERING CONTROLS
■ Local exhaust ventilation usually required. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection. Supplied-air type respirator may be required in special circumstances. Correct fit is essential to ensure adequate protection.
An approved self contained breathing apparatus (SCBA) may be required in some situations.
Provide adequate ventilation in warehouse or closed storage area. Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.

Type of Contaminant:	Air Speed:
solvent, vapours, degreasing etc., evaporating from tank (in still air).	0.25- 0.5 m/s (50- 100 f/min.)
aerosols, fumes from pouring operations, intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation)	0.5- 1 m/s (100- 200 f/min.)
direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)	1- 2.5 m/s (200- 500 f/min.)
grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).	2.5- 10 m/s (500- 2000 f/min.)

Within each range the appropriate value depends on:

Lower end of the range	Upper end of the range
1: Room air currents minimal or favourable to capture	1: Disturbing room air currents
2: Contaminants of low toxicity or of nuisance value only.	2: Contaminants of high toxicity
3: Intermittent, low production.	3: High production, heavy use
4: Large hood or large air mass in motion	4: Small hood- local control only

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 f/min) for extraction of solvents generated in a tank 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE
Clear to light yellow hygroscopic liquid with nauseating, unpleasant, weak, ammonia-like odour. Miscible with water, ethanol, acetone, ether, benzene and petroleum ether. A relatively strong base.

continued...

PHYSICAL PROPERTIES
Liquid.
Mixes with water.
Corrosive.
Alkaline.

State	Liquid	Molecular Weight	117.22
Melting Range (°C)	- 70	Viscosity	4.6 cSt@40°C
Boiling Range (°C)	161- 163	Solubility in water (g/L)	Miscible
Flash Point (°C)	52	pH (1% solution)	11.5 @ 10%
Decomposition Temp (°C)	Not Available	pH (as supplied)	Not applicable
Autoignition Temp (°C)	320	Vapour Pressure (kPa)	0.18 @ 20 C
Upper Explosive Limit (%)	10.1	Specific Gravity (water=1)	0.88- 0.89 @ 20C.
Lower Explosive Limit (%)	0.7	Relative Vapour Density (air=1)	4.03
Volatile Component (%vol)	100	Evaporation Rate	0.17 BuAc=1
Gas group	IIA		

Material	Value
DIETHYLAMINOETHANOL:	
log Kow	0.21- 0.46

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY
• Presence of incompatible materials.
• Product is considered stable.
• Hazardous polymerisation will not occur.
For incompatible materials - refer to Section 7 - Handling and Storage.

Section 11 - TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED
■ The material can produce chemical burns within the oral cavity and gastrointestinal tract following ingestion.
■ Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.
■ Ingestion of alkaline corrosives may produce burns around the mouth, ulcerations and swellings of the mucous membranes, profuse saliva production, with an inability to speak or swallow. Both the oesophagus and stomach may experience burning pain; vomiting and diarrhoea may follow. Epiglottal swelling may result in respiratory distress and asphyxia; shock can occur. Narrowing of the oesophagus, stomach or stomach valve may occur immediately or after a long delay (weeks to years). Severe exposure can perforate the oesophagus or stomach leading to infections of the chest or abdominal cavity, with low chest pain, abdominal stiffness and fever. All of the above can cause death.

EYE
■ The material can produce chemical burns to the eye following direct contact. Vapours or mists may be extremely irritating.
■ If applied to the eyes, this material causes severe eye damage.

continued...

■ Eye contact with liquid diethylaminoethanol may result in severe pain, irritation, redness and corrosive injury. Blindness may result if not promptly treated.
Vapour or mist may cause eye irritation and a minor temporary oedema(swelling) of the surface of the cornea, which causes a visual effect called blue haze'.
■ Direct eye contact with corrosive bases can cause pain and burns. There may be swelling, epithelium destruction, clouding of the cornea and inflammation of the iris. Mild cases often resolve; severe cases can be prolonged with complications such as persistent swelling, scarring, permanent cloudiness, bulging of the eye, cataracts, eyelids glued to the eyeball and blindness.

SKIN
■ The material can produce chemical burns following direct contactwith the skin.
■ Skin contact with the material may be harmful; systemic effects may result following absorption.
■ The material is not thought to be a skin irritant (as classified by EC Directives using animal models).
Temporary discomfort, however, may result from prolonged dermal exposures. Good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.
■ Skin contact with alkaline corrosives may produce severe pain and burns; brownish stains may develop. The corroded area may be soft, gelatinous and necrotic; tissue destruction may be deep.
■ Open cuts, abraded or irritated skin should not be exposed to this material.
■ Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

INHALED
■ The material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage.
■ Diethylaminoethanol (DEAE) vapour or mist can severely irritate the nose,throat and lungs and may cause sore throat, laryngitis, coughing, wheezing, shortness of breath, headache, nausea and vomiting.
An odor threshold of 0.011 ppm (approx. 0.053 mg/mg3) has been reported. In a laboratory worker short-time exposure to approx. 100 ppm (480 mg/m3) DEAE caused nausea and vomiting. Subjects exposed to DEAE vapor by humidified air in office buildings complained about eye, nose and throat irritation, dizziness, nausea and vomiting. Also several cases of asthma were observed. However, these symptoms were more consistent with reactive airway dysfunction syndrome (RADS) than with an allergic respiratory reaction. In one case detectable amounts of 2-diethylaminoethanol were 0.05 and 0.04 mg/m3.
An attempt by a laboratory worker to remove animals from an inhalation chamber containing approximately 100 ppm resulted in nausea and vomiting within 5 minutes after a fleeting exposure.
In rats repeated daily inhalation exposure at 500 ppm (+/- 10%) produced marked eye and nasal irritation on the first exposure day, mild tremors of the head and forelegs through to day 5 of the experiment with 4 of 20 animals fatally poisoned by day 5. Autopsy showed purulent bronchitis and bronchopneumonia but no other organ involvement.
■ Inhaling corrosive bases may irritate the respiratory tract. Symptoms include cough, choking, pain and damage to the mucous membrane. In severe cases, lung swelling may develop, sometimes after a delay of hours to days. There may be low blood pressure, a weak and rapid pulse, and crackling sounds.
■ Inhalation of aerosols (mists, fumes), generated by the material during the course of normal handling, may be harmful.

CHRONIC HEALTH EFFECTS
■ Long-term exposure to respiratory irritants may result in disease of the airways involving difficult breathing and related systemic problems.
There is limited evidence that, skin contact with this product is more likely to cause a sensitisation reaction in some persons compared to the general population.
Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.
Repeated or prolonged exposure to corrosives may result in the erosion of teeth, inflammatory and ulcerative changes in the mouth and necrosis (rarely) of the jaw. Bronchial irritation, with cough, and frequent attacks of bronchial pneumonia may ensue. Gastrointestinal disturbances may also occur. Chronic exposures may result in dermatitis and/or conjunctivitis.
Both secondary amines and tertiary amines can be nitrosated by nitrosating agents to yield nitrosamines. In the case of tertiary amines, the mechanism involves intermediate conversion of the tertiary amine to a

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secondary amine.
Some types of nitrosamines have been shown to be carcinogenic in tests using laboratory animals. In general, all nitrosamines are presumed to be carcinogenic unless they've been tested and shown to be relatively harmless. Nitrosamines are often generated as undesired byproducts in certain foods (especially bacon) and cosmetic and hygiene products (such as shampoo and hair conditioner).
The occurrence of significant levels of nitrosamines in commercial products is normally not accepted. In formulations which contain nitrosating agents, formation of nitrosamines can become a concern where secondary and/or tertiary amines are used as pH control agents. The most typical nitrosating agents added to formulations are nitrite salts such as sodium or potassium nitrite. Such nitrites are generally added as corrosion inhibitors. Formation of nitrosamine contaminants in such formulations usually results from the reaction of such nitrosating agents with secondary and/or tertiary amines. Nitrosation can occur during product preparation, either during heating or at moderate temperatures. It can also occur while a product sits on a shelf, especially if the product sits for months in a warehouse that becomes warm. Many efforts have been made to eliminate nitrosamines from various substances, or to reduce their concentrations to the lowest practical levels. In various types of food, the use of ascorbic acid (vitamin C) and alpha-tocopherol (vitamin E) and their salts is known to inhibit nitrosamine formation.
In animal experiments the oesophagus is shown to be the most important target organ for nitrosamines, independent of the route of application. The mechanism of this organotrophy cannot be explained sufficiently. The high oesophageal epithelium metabolic activation of nitrosamines, together with a comparatively low DNA repair, probably plays the most important role. In addition chronic stress factors, which lead to high stimulation of epithelial turnover, are a pacemaker for malignant progression. In some countries, the traditional consumption of extremely hot drinks leads to constant burns of the oesophagus, which increases the risk. Mate, a non-alcoholic brew, frequently consumed as tea in Uruguay, appears to be a high risk factor for oesophageal cancer.

TOXICITY AND IRRITATION
■ unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

TOXICITY
Oral (rat) LD50: 1300 mg/kg
Inhalation (human) TCLo: 200 ppm
Inhalation (rat) LCLo: 4500 mg/m³/4h
Inhalation (Human) TCLo: 200 ppm/4h
Inhalation (Rat) LC: 4500 mg/m³/4h
Intraperitoneal (Rat) LD50: 1220 mg/kg
Inhalation (Mouse) LC50: 5000 mg/m³/4h
Intraperitoneal (Mouse) LD50: 192 mg/kg
Subcutaneous (Mouse) LD50: 650 mg/kg
Intravenous (Mouse) LD50: 188 mg/kg

IRRITATION
Skin (rabbit): 10 mg/24h - Open
Skin (rabbit): 500 mg- Open - Mild
Eye (rabbit) : 5 mg - SEVERE

■ Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production.
The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.
The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.
For diethylaminoethanol (DEAE)
Acute toxicity: DEAE was rapidly absorbed via the oral route. It is presumably absorbed by dermal and inhalation routes of administration. In the rat it was widely distributed to many tissues. It was primarily

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excreted unchanged via the urine in rats. Excretion via the feces was also observed in rats, but to a lesser extent. Urinary excretion was also reported in humans. The major metabolites in rats were reported to be diethylaminoacetic acid and diethyl-(2- hydroxyethyl)-amino-oxide.
The LD50 for the rat after oral administration was 1320 mg/kg bw. The main clinical signs described were apathy and dyspnea. After inhalation of vapors of DEAE an LC50 of ca. 4600 mg/m3/4 hour was estimated in rats using Haber's rule. Severe signs of irritation were observed, e.g. mucous membrane irritation and dyspnea.
A dermal LD50 in guinea pigs was reported to be ca. 885 mg/kg bw.
DEAE was corrosive to the skin of rabbits; since the pH was measured to be 11.5 (100 g/l) at 20 C, the corrosive effects are not surprising. The potential for severe damage to the eyes can be expected based on the animal studies available and on the pH. DEAE was not sensitizing to the skin in studies with guinea pigs.
A similar material, N,N-dimethylethanolamine, has been demonstrated to be a cause of occupational asthma
Repeat dose toxicity: Repeated 6 month DEAE exposures of 200 ppm in rats produced weight loss and even death in a few animals by the end of one month; however after one month apparent adaptation occurred with no further mortality. Repeated inhalation exposures for 14 weeks at 76 ppm in rats have been known to produce respiratory tract irritation, corneal opacities, nasal lesions, liver, and kidney
Repeated exposure of rats to DEAE vapors (up to 365 mg/m3) for 14 weeks caused local toxicity (irritation) at the site of contact, namely, the upper respiratory tract and the eyes; however, systemic toxicity was not observed (NOAEC, systemic toxicity, 365 mg/m 3 or 76 ppm). After inhalation exposure, the main symptom described was respiratory irritation which led to noises called rales and irritation of the eyes. The LOAEC for local toxicity (irritation) to the respiratory tract was 120 mg/m3 (25 ppm) and the NOAEC for local toxicity was 53 mg/m3 (10 ppm) based on histopathological effects in the nasal cavity. However, since an effect (rales) was seen at the lowest concentration a NOEC was not reached.
Genetic toxicity: DEAE gave no evidence of in vitro mutagenic activity nor in vivo clastogenic potential. Results from a number of mutagenicity studies with microorganisms, mammalian cell culture and mammals are available. Taking into account all of the information, there is no indication that the substance is mutagenic. DEAE is not mutagenic in a variety of in vitro and in vivo assays
Reproductive and developmental toxicity: DEAE has been shown to cause testicular and thyroid atrophy in laboratory animals by chronic feeding. These effects, however, were not observed in a subchronic inhalation study. No adverse effects were noted in the offspring of rats exposed to DEAE by inhalation during pregnancy. Repeated oral uptake of the substance did not cause damage to the reproductive organs. Repeated inhalative uptake of the substance did not cause damage to the reproductive organs. Repeated exposure of rats to DEAE vapors (365 mg/m3) for 14 weeks did not cause any adverse effects on the reproductive organs when administered by inhalation. In pregnant rats even the highest concentration tested of 486 mg/m3, which already produced maternally toxic effects, did not lead to adverse developmental effects. No indications of a developmental toxic / teratogenic effect were seen in animal studies.
Carcinogenicity: In a limited study, DEAE was not carcinogenic to rats when given by feed (tested up to ca. 50-400 mg/kg/d).

SKIN

diethylaminoethanol	Australia Exposure Standards - Skin	Notes	Sk

Section 12 - ECOLOGICAL INFORMATION

Refer to data for ingredients, which follows:

DIETHYLAMINOETHANOL:
■ log Pow (Verschueren 1983): 0.31/0.46

■ For diethylaminoethanol
log Kow : 0.21-0.46
BOD 76% after 20 days
ThOD 2.33 mg/mg (calculated)
DEAE is a colourless – light yellowish organic liquid. The hygroscopic substance is miscible with water in all proportions, has a vapor pressure of about 1.8 hPa at 20 °C. The density is 0.885 g/cm3. Melting point

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and boiling point are – 68 C and 162-163 C (at 1013 hPa) respectively.
Environmental fate:
The distribution of the substance between the compartments of air, biota, sediment, soil and water was calculated according to Mackay Level I. The non-charged molecule distributes mainly to the water (99.1 %).
A soil adsorption coefficient (Koc) of 5.98 was estimated for DEAE . This Koc value suggests that this compound would be mobile in soil and adsorption to suspended solids would not be important.
From the pKa-value of 9.87 it can be assumed that under environmental conditions the substance is available as a cation. Therefore, binding of the substance to the matrix of soils with high capacities for cation exchange (e.g. clay) cannot be excluded. However, no data was available for ionic-ionic interactions in soil.
The calculated Henry's law constant (3.16x10-4 Pa m3 mol-1 at 25 C) and complete water solubility of DEAE suggest that volatilisation from water would not be an important fate process. The substance has no considerable potential for bioaccumulation (log Kow = 0.21, measured). The compound is readily biodegradable (OECD 301 A, 95% after 22 days 10 d-window fulfilled). . The photodegradation rate in the atmosphere is fast under environmental conditions (50% after 3.9 hours).
Biodegradation:
Test method: OECD Guideline 302 B (aerobic), activated sludge, domestic
Degree of elimination: 96 % (14 d)
Test method: OECD 301 A (new version) (aerobic), activated sludge, domestic
Method of analysis: DOC reduction
Degree of elimination: 90 - 100 % (22 d)
Evaluation: Readily biodegradable (according to OECD criteria).
Bioaccumulation:
Accumulation in organisms is not to be expected
Ecotoxicity:
Fish LC50 (96 h): >100-<220 mg/l (nominal concentration) (DIN 38412 Part 15 static)
Fish LC50 (96 h): Leuciscus idus 147 mg/l (nominal concentration)
The toxic effect may be (partly) due to the high pH of the non-neutralised test solutions, since the pH adjusted 1000 mg/l dose group tolerated the substance for 96 h without mortality.
Fish LC50 (96 h): 1780 mg/l (measured concentration, adjustment of pH)
Daphnia magna EC50 (48 h): 83.6 mg/l (nominal concentration) Directive 79/831/EEC
Daphnia magna: EC50 (48 h) = 83.6 mg/l (nominal concentration) (toxicity due to pH effects cannot be excluded)
Daphnia magna EC50 (48 h) = 165 mg/l (nominal concentration, adjustment of pH)
Algae EC50 (72 h): 30 mg/, 44 mg/l (nominal concentration) DIN 38412 part 9
Alage ErC50: Scenedesmus subspicatus 44 mg/l; NOEC 5 mg/l; EbC50 30 mg/l; NOEC 5 mg/l
Activated sludge EC20 (30 m): >1000 mg/l (OECD 209 aquatic).
■ Prevent, by any means available, spillage from entering drains or water courses.
■ DO NOT discharge into sewer or waterways.

Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
diethylaminoethanol	LOW		LOW	HIGH

GESAMP/EHS COMPOSITE LIST - GESAMP Hazard Profiles

Name / Cas No / RTECS No	EHS	TRN	A1a	A1b	A1	A2	B1	B2	C1	C2	C3	D1	D2	D3	E1	E2	E3
-	622	241	0	NI	0	NR	3	NI	1	1	2	3	3			D	3
CAS:100-37- 8 / KK5075000																	

Legend:
EHS=EHS Number (EHS=GESAMP Working Group on the Evaluation of the Hazards of Harmful Substances Carried by Ships) NRT=Net Register Tonnage, A1a=Bioaccumulation log Pow, A1b=Bioaccumulation BCF, A1=Bioaccumulation,

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Section 12 - ECOLOGICAL INFORMATION

A2=Biodegradation, B1=Acuteaquatic toxicity LC/ECIC50 (mg/l), B2=Chronic aquatic toxicity NOEC (mg/l), C1=Acute mammalian oral toxicity LD50 (mg/kg), C2=Acutemammalian dermal toxicity LD50 (mg/kg), C3=Acute mammalian inhalation toxicity LC50 (mg/kg), D1=Skin irritation & corrosion, D2=Eye irritation& corrosion, D3=Long-term health effects, E1=Tainting, E2=Physical effects on wildlife & benthic habitats, E3=Interference with coastal amenities,
For column A2: R=Readily biodegradable, NR=Not readily biodegradable.
For column D3: C=Carcinogen, M=Mutagenic, R=Reprotoxic, S=Sensitising, A=Aspiration hazard, T=Target organ systemic toxicity, L=Lunginjury, N=Neurotoxic, I=Immunotoxic.
For column E1: NT=Not tainting (tested), T=Tainting test positive.
For column E2: Fp=Persistent floater, F=Floater, S=Sinking substances.
The numerical scales start from 0 (no hazard), while higher numbers reflect increasing hazard.
(GESAMP/EHS Composite List of Hazard Profiles - Hazard evaluation of substances transported by ships)

Section 13 - DISPOSAL CONSIDERATIONS

- Containers may still present a chemical hazard/ danger when empty.
- Return to supplier for reuse/ recycling if possible.

Otherwise:

- If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill.
- Where possible retain label warnings and MSDS and observe all notices pertaining to the product.

Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.
A Hierarchy of Controls seems to be common - the user should investigate:

- Reduction,
- Reuse
- Recycling
- Disposal (if all else fails)

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. If it has been contaminated, it may be possible to reclaim the product by filtration, distillation or some other means. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.

- DO NOT allow wash water from cleaning or process equipment to enter drains.
- It may be necessary to collect all wash water for treatment before disposal.
- In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.
- Where in doubt contact the responsible authority.
- Recycle wherever possible.
- Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified.
- Treat and neutralise at an approved treatment plant. Treatment should involve: Neutralisation with suitable dilute acid followed by: burial in a land-fill specifically licenced to accept chemical and / or pharmaceutical wastes or Incineration in a licenced apparatus
- Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.

Section 14 - TRANSPORTATION INFORMATION

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Section 14 - TRANSPORTATION INFORMATION

Labels Required: CORROSIVE,FLAMMABLE LIQUID

HAZCHEM:
□ *2W Use alcohol resistant foam

Land Transport UNDG:

Class or division:	8	Subsidiary risk:	3
UN No.:	2686	UN packing group:	II

Shipping Name:2-DIETHYLAMINOETHANOL

Air Transport IATA:

ICAO/IATA Class:	8 (3)	ICAO/IATA Subrisk:	None
UN/ID Number:	2686	Packing Group:	II
Special provisions:	None		

Shipping Name: 2-DIETHYLAMINOETHANOL

Maritime Transport IMDG:

IMDG Class:	8	IMDG Subrisk:	3
UN Number:	2686	Packing Group:	II
EMS Number:	F- E, S- C	Special provisions:	None
Limited Quantities:	1 L		

Shipping Name: 2-DIETHYLAMINOETHANOL

GESAMP hazard profiles for this material can be found in section 12 of the MSDS.

Section 15 - REGULATORY INFORMATION

REGULATIONS

diethylaminoethanol (CAS: 100-37-8) is found on the following regulatory lists;
"Australia Exposure Standards","Australia Hazardous Substances","Australia Inventory of Chemical Substances (AICS)","GESAMP/EHS Composite List - GESAMP Hazard Profiles","IMO IBC Code Chapter 17: Summary of minimum requirements","IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk", "International Council of Chemical Associations (ICCA) - High Production Volume List","OECD Representative List of High Production Volume (HPV) Chemicals","The Australia Group Export Control List: Chemical Weapons Precursors"

Section 16 - OTHER INFORMATION

MSDS SECTION CHANGES

The following table displays the version number of and date on which each section was last changed.

Section Name	Version	Date	Section Name	Version	Date	Section Name	Version	Date
First Aid (eye)	6	25- Jan- 2009	Storage (storage requirement)	6	25- Jan- 2009	Acute Health (eye)	6	25- Jan- 2009
First Aid (inhaled)	5	5- Oct- 2006	Storage (suitable container)	6	25- Jan- 2009	Acute Health (inhaled)	6	25- Jan- 2009
First Aid (skin)	6	25- Jan- 2009	Engineering Control	6	25- Jan- 2009	Acute Health (skin)	6	25- Jan- 2009
First Aid	6	25- Jan- 2009	Exposure Standard	6	25- Jan- 2009	Acute Health	6	25- Jan- 2009

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Section 16 - OTHER INFORMATION

(swallowed)						(swallowed)		
Fire Fighter (extinguishing media)	6	25- Jan- 2009	Personal Protection (eye)	6	25- Jan- 2009	Chronic Health	6	25- Jan- 2009
Fire Fighter (fire fighting)	6	25- Jan- 2009	Personal Protection (hands/feet)	6	25- Jan- 2009	Toxicity and Irritation (Other)	5	5- Oct- 2006
Fire Fighter (fire/explosion hazard)	6	25- Jan- 2009	Personal Protection (other)	6	25- Jan- 2009	Toxicity and Irritation (Toxicity Figure)	5	5- Oct- 2006
Spills (major)	6	25- Jan- 2009	Appearance	6	25- Jan- 2009	Environmental	6	25- Jan- 2009
Spills (minor)	6	25- Jan- 2009	Physical Properties	5	5- Oct- 2006	Disposal	6	25- Jan- 2009
Handling Procedure	6	25- Jan- 2009	Instability Condition	6	25- Jan- 2009	Transport	6	25- Jan- 2009
Storage (storage incompatibility)	6	25- Jan- 2009						

The above information is believed to be accurate and represent the best information currently available to us, but does not represent any warranty expressed or implied of the properties of the product. User should make their own investigation to determine the suitability of the information for their particular purpose.

Issue Date: 25-Jan-2018