



SAFETY DATA SHEET DIETHANOLAMINE

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : DIETHANOLAMINE
 CAS Number: 111-42-2
 Chemical characterization : Ethanolamines
 Chemical Name : 2,2'iminobisethanol
 Synonyms : All Grades includes: DEA, DEA-LFG

 Use of the Substance/Mixture : Surface active agents, Rubber Production and processing, Cosmetics, personal care products, Petroleum demulsifiers, Plasticizing agents, Gas-scrubber in refinery and natural gas operations

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SECTION 2. HAZARDS IDENTIFICATION

GHS Classification

Acute toxicity, Oral	Category 4
Serious eye damage	Category 1
Skin irritation	Category 2
Reproductive toxicity	Category 2
Specific target organ systemic toxicity - single exposure, Oral, Liver, Kidney	Category 2
Specific target organ systemic toxicity - repeated exposure, Oral, Liver, Kidney	Category 2
Acute aquatic toxicity	Category 2
Chronic aquatic toxicity	Category 3

GHS Classification Scale (1= severe hazard; 4= slight hazard)

Label elements

Hazard symbols**Signal Word**

: Danger

Hazard Statements

: H302 Harmful if swallowed.
 H315 Causes skin irritation.
 H318 Causes serious eye damage.
 H361f Suspected of damaging fertility.
 H371 May cause damage to organs (Liver, Kidney).
 H373 May cause damage to organs (Liver, Kidney) through prolonged or repeated exposure.
 H401 Toxic to aquatic life.
 H412 Harmful to aquatic life with long lasting effects.

Precautionary Statements: **Prevention**

P201 Obtain special instructions before use.
 P260 Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.
 P264 Wash hands thoroughly after handling.
 P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response

P301 + P312 IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel unwell.
 P308 + P313 IF exposed or concerned: Get medical advice/ attention.
 P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
 P362 Take off contaminated clothing and wash before reuse.

Other hazards

No additional information available.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS**Hazardous ingredients**

Component	CAS-No.	Weight %
Diethanolamine	111-42-2	83.0 - 100.0 %

SECTION 4. FIRST AID MEASURES**First aid procedures**

- General advice : Consult a physician/doctor if necessary.
Take proper precautions to ensure your own health and safety before attempting rescue and providing first aid. For specific information refer to the Emergency Overview in Section 2 of this SDS.
Show this material safety data sheet to the doctor in attendance.
- If inhaled : Move the exposed person to fresh air at once. If breathing has stopped, perform artificial respiration. When breathing is difficult, properly trained personnel may assist the affected person by administering oxygen. Keep the affected person warm and at rest. Get medical attention immediately.
- In case of skin contact : Immediately remove excess chemical and contaminated clothing; thoroughly wash contaminated skin with mild soap and water. If irritation persists after washing, seek medical attention. Thoroughly clean contaminated clothing before reuse; discard contaminated leather goods (gloves, shoes, belts, wallets, etc.).
After contact with skin, wash immediately with plenty of soap and water.
- In case of eye contact : Immediately flush eyes thoroughly with plenty of water and continue flushing for at least 15 minutes.
Remove contact lenses.
Seek immediate medical attention, preferably an ophthalmologist.
- If swallowed : DO NOT induce vomiting.
Never give anything by mouth to an unconscious person.
Obtain emergency room treatment immediately.

Notes to physician

- Hazards : Harmful if swallowed.
Causes serious eye damage.
Causes skin irritation.
Suspected of damaging fertility.
- Treatment : Treat symptomatically.
Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.

SECTION 5. FIRE-FIGHTING MEASURES**Flammable properties**

Flash point : > 280 °F (138 °C)
at 1,013 hPa (760 mm Hg)
Method: Pensky-Martens Closed Cup

Autoignition temperature : 671 °F (355 °C)
at 1,013 hPa (760 mm Hg)

Lower explosion limit : 2.1 vol%

Upper explosion limit : 10.6 vol%

Fire fighting

Suitable extinguishing media : SMALL FIRE: Use dry chemical, CO₂, water spray or regular foam. LARGE FIRE: Use water spray, water fog or regular foam. Do not use straight streams.
Alcohol resistant foam.

Unsuitable extinguishing media : Do not use solid water stream/may spread fire.

Further information : Always stay away from tanks engulfed in fire.
Use water spray to cool unopened containers.
Fight fire from a safe distance/protected location.
Do not use straight streams.
Move containers from fire area if it can be done without risk.

Protective equipment and precautions for firefighters

Specific hazards during fire fighting : Though not normally combustible, exposure to fire may build enough pressure to rupture closed containers, spreading contents, which are harmful if inhaled, swallowed, or splashed in the eyes or on the skin.
Oxides of nitrogen will be evolved.
Water may be ineffective, but should be used to keep fire-exposed containers cool.
Move containers from fire area if it can be done without risk.
For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.
Always stay away from tanks engulfed in fire.
When fighting a fire, notify environmental authorities if liquid runoff enters sewers or public waters.

Special protective equipment for fire-fighters : Wear positive pressure self-contained breathing apparatus (SCBA).
Structural firefighter's protective clothing will only provide limited protection.
Fight fire from a safe distance/protected location.

SECTION 6. ACCIDENTAL RELEASE MEASURES

- Personal precautions : Evacuate personnel to safe areas.
Keep people away from and upwind of spill/leak.
Avoid direct contact with released material. Stay upwind.
Do not touch or walk through spilled material.
Prevent product from entering drains.
Prevent further leakage or spillage if safe to do so.
Use personal protective equipment.
Refer to protective measures listed in sections 7 and 8.
- Environmental precautions : Do not allow contact with soil, surface or ground water.
Prevent product from entering drains.
Prevent further leakage or spillage.
- Methods for containment /
Methods for cleaning up : Do not touch or walk through spilled material.
Stop leak if you can do it without risk.
Soak up small spills with inert solids and shovel into suitable disposal containers.
For large spills, dike and pump into properly labeled containers for reclamation or disposal. For small spills, soak up with absorbent material and place in properly labeled containers for disposal.
Prevent entry into waterways, sewers, basements or confined areas.
- Additional advice : Mark the contaminated area with signs and prevent access to unauthorized personnel.
See section 13 for disposal information.
See Section 15: Regulatory Information.

SECTION 7. HANDLING AND STORAGE**Handling**

- Advice on safe handling : Avoid contact with eyes, skin and clothing.
Do not swallow.
After handling, always wash hands thoroughly with soap and water.
Containers, even those that have been emptied, will retain product residue and vapor and should be handled as if they were full. Do not eat, drink or smoke in areas where this material is used.
Do not handle near heat, sparks, or flame. Avoid contact with incompatible agents. Use only with adequate ventilation/personal protection. Avoid contact with eyes, skin and clothing. Do not enter storage area unless adequately ventilated. Metal containers involved in the transfer of this material should be grounded and bonded.
For personal protection see section 8.

Advice on protection against fire and explosion : not applicable

Storage

Requirements for storage areas and containers : Store in a dry place.
Avoid moisture.
Do not store in:
Aluminum
Copper
Copper alloys
Avoid Freezing
This product is typically stored, loaded, and shipped in a liquid state
Store containers in a cool, dry, ventilated, fire resistant area away from sources of ignition and incompatible materials.
Keep container tightly closed and properly labeled.

Storage period : 24 Months

Storage temperature : 93 - 120 °F (34 - 49 °C)

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Ingredients	CAS-No.	Value	Control parameters	Update	Basis
Diethanolamine	111-42-2	TWA	1 mg/m ³	2012	US (ACGIH)

Engineering measures

Engineering measures : Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits.
Emergency shower and eyewash facility should be in close proximity (ANSI Z358.1)

Personal protective equipment

Protective measures : Wear full protective clothing and self-contained breathing apparatus.
Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place.

Eye protection : Eye protection such as chemical splash goggles and/or face shield must be worn when possibility exists for eye contact

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- due to splashing or spraying liquid, airborne particles, or vapor.
- Hand protection : Wear chemical resistant gloves such as:
Butyl rubber.
Neoprene.
Nitrile.
PVC
or
Viton(TM).
- Skin and body protection : Appropriate protective clothing should be worn to prevent skin contact.
- Respiratory protection : When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.
Use an approved respirator, either air-supplied or air purifying (consult your company safety professional for guidance). The type of respiratory protection will depend upon whether the maximum exposure concentration is known.
- Hygiene measures : Selection of appropriate personal protective equipment should be based on an evaluation of the performance characteristics of the protective equipment relative to the task(s) to be performed, conditions present, duration of use, and the hazards and/or potential hazards that may be encountered during use.
Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.
Use good personal hygiene practices.
Wash hands thoroughly after use.
Take off contaminated clothing and wash before reuse.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

- Form : liquid
- Color : Colorless.
- Odor : Ammonia-like.

Safety data

- Flash point : > 280 °F (138 °C)
at 1,013 hPa (760 mm Hg)
Method: Pensky-Martens Closed Cup
- Lower explosion limit : 2.1 vol%

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Upper explosion limit	: 10.6 vol%
Oxidizing properties	: Not considered an oxidizing agent.
Autoignition temperature	: 671 °F (355 °C) at 1,013 hPa (760 mm Hg)
Decomposition temperature	: not determined
pH	: 11
Melting point/freezing point	: <= 82 °F (28 °C) Water is added to Low Freeze Grades to depress freezing point.
Boiling point/boiling range	: 212 - 520 °F (100 - 271 °C) at 1,013 hPa (760 mm Hg)
Vapor pressure	: < 0.01 hPa (0.01 mm Hg) at 68 °F (20 °C)
Density	: 1.1 g/cm ³ at 68 °F (20 °C)
Water solubility	: Miscible
Partition coefficient: n-octanol/water	: log Pow: -2.3 at 77 °F (25 °C)
Viscosity, kinematic	: ~354 - 527 mm ² /s at 77 - 86 °F (25 - 30 °C)
Relative vapor density	: 3.65 (Air = 1.0)
Explosive properties	: Not explosive
Remarks - Other information	: (Above properties based on Diethanolamine)

SECTION 10. STABILITY AND REACTIVITY

Reactivity	: Will not occur.
Chemical stability	: Stable under recommended storage conditions.
Conditions to avoid	: Avoid contact with strong oxidizers, excessive heat, sparks or

	open flame. Moisture and humidity.
Materials to avoid	: Strong acids Strong oxidizer. Nitrates. Halogenated hydrocarbons. Product may potentially react with various halogenated organic solvents, resulting in temperature and/or pressure increases. Corrosive when wet. Heating above 60°C in the presence of aluminum can result in corrosion and generation of flammable hydrogen gas.
Hazardous decomposition products	: Carbon Monoxide and Carbon dioxide. Ammonia and oxides of nitrogen.
Thermal decomposition	: Carbon oxides (CO, CO ₂)
Hazardous reactions	: Will not occur. Stable under recommended storage conditions.

SECTION 11. TOXICOLOGICAL INFORMATION

Product Summary	: The below given information is based on the assessment of the product including impurities.
Acute toxicity	
Acute oral toxicity	: Classified Harmful if swallowed. Ingestion may cause discomfort and irritation of the gastrointestinal tract, respiratory difficulty, and damage to the liver and kidneys.
	: LD50: 780 mg/kg
Acute inhalation toxicity	: Based on acute toxicity values, not classified.
	: LC0: 3.35 mg/l Exposure time: 4 HOURS
Acute dermal toxicity	: Not classified Not classified due to lack of data.
	: Not expected to be a skin absorption hazard.
Skin corrosion/irritation	: Classified Causes skin irritation.

Serious eye damage/eye irritation : Classified
Causes serious eye damage.

Respiratory or skin sensitization : Respiratory sensitization
Not classified
no data available

: Skin sensitization
Not classified
No adverse effect observed.

Chronic toxicity

Component Name	NTP	IARC	OSHA
Diethanolamine		2B	Present

Carcinogenicity : Not classified
Contains a substance that has a positive carcinogenicity study.
The weight of evidence for the carcinogenicity of this substance does not meet the criteria for classification.

Germ cell mutagenicity : Not classified
No adverse effect observed.

Reproductive toxicity

Effects on fertility / Effects on or via lactation : Classified
Suspected of damaging fertility.
May cause toxicity to male reproduction.
Testicular effects have been found after repeated exposures.

Effects on Development : Not classified
No adverse effect observed.

Target Organ Systemic Toxicant - Single exposure : Routes of exposure: Ingestion
Target Organs: Liver, Kidney
Classified, May cause damage to organs.

Target Organ Systemic Toxicant - Repeated exposure : Routes of exposure: Ingestion
Target Organs: Liver, Kidney
Classified, May cause damage to organs through prolonged or repeated exposure.

Aspiration hazard : Based on physico-chemical values or lack of human evidence, not classified.

12. ECOLOGICAL INFORMATION**Ecotoxicology Assessment**

Acute aquatic toxicity : Classified
Toxic to aquatic life.

Chronic aquatic toxicity : Classified
Harmful to aquatic life with long lasting effects.

Toxicity to fish :
Acute toxicity to fish is very low.

Toxicity to daphnia and other aquatic invertebrates : Test substance: Based on Diethanolamine
Moderately toxic to aquatic invertebrates.

: EC50: 55 mg/l
Exposure time: 48 HOURS
Species: Daphnia magna (Water flea)
Immobilization

Toxicity to algae : Test substance: Based on Diethanolamine
Toxic to algae.

: ErC50: 2.2 mg/l
Exposure time: 96 HOURS
Species: Pseudokirchneriella subcapitata (green algae)
Growth inhibition

Toxicity to bacteria : Low toxicity to sewage microbes.

Toxicity to fish (Chronic toxicity) : No Data Available.

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : Test substance: Based on Diethanolamine
Harmful to aquatic invertebrates (chronic exposure)

NOEC: 0.78 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)

Persistence and degradability

Biodegradability : 93 %

Readily biodegradable
(After 28 days in a ready biodegradability test)

Bioaccumulative potential

Bioaccumulation : Bioconcentration factor (BCF): 3.16
Method: (QSAR calculated value)
This material is not expected to bioaccumulate.

Mobility in soil

Distribution among environmental compartments : Stability in water
no data available

: Stability in soil
no data available

Additional advice Environmental fate and pathways : No additional information available.

Results of PBT and vPvB assessment

Not applicable.

Other adverse effects

Additional ecological information : No additional information available.

SECTION 13. DISPOSAL CONSIDERATIONS

Further information : Do not dispose of waste into sewer.
Do not contaminate ponds, waterways or ditches with chemical or used container.
Dispose of all waste and contaminated equipment in accordance with all applicable federal, state and local health and environmental regulations. Recovery and reuse, rather than disposal, should be the ultimate goal of handling efforts. The materials resulting from clean-up operations may be hazardous wastes and therefore, subject to specific regulations.

Contaminated packaging : Dispose of contents/ container to an approved incineration plant.

SECTION 14. TRANSPORT INFORMATION

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DOT

UN number : 3077
 Description of the goods : Environmentally hazardous substances, solid, n.o.s. Molten
 : (DIETHANOLAMINE)
 Class : 9
 Packing group : III
 Labels : 9

SECTION 15. REGULATORY INFORMATION

If identified components of this product are listed under the TSCA 12(b) Export Notification rule, they will be listed below.

SARA 302/304

<u>Component</u>	<u>TPQ</u>	<u>RQ</u>
Diethanolamine		100 lbs

SARA 311/312

Based upon available information, this material is classified as the following health and/or physical hazards according to Section 311 & 312:

Immediate (Acute) Health Hazard.
 Delayed (Chronic) Health Hazard.

SARA 313

This product contains the following chemicals subject to the reporting requirements of SARA Title III, Section 313 and 40 CFR 372:

<u>Component</u>	<u>Reporting Threshold</u>
Diethanolamine	1.0%

State Reporting

This material contains the following chemical substance which is regulated under California Proposition 65. However, it is the responsibility of the California business owner to develop his or her own regulatory compliance plan.

Substance	CASRN	Type of Toxicity			
		Carcinogen	Developmental	Repro-Male	Repro-Female
Diethanolamine	111-42-2	X			

This product contains the following chemicals regulated by New Jersey's Worker and Community Right to Know Act:

111-42-2 Diethanolamine

This product contains the following chemicals regulated by Massachusetts' Right to Know Law:

111-42-2 Diethanolamine

This product contains the following chemicals regulated by Pennsylvania's Right to Know Act:
111-42-2 Diethanolamine

Other international regulations

Global Inventory Status

The ingredients of this product are compliant with the following chemical inventory requirements or exemptions.

*Additional Explanatory Status Statements follow the table, as necessary.

Country/Region	Inventory	Status Description
Australia	AICS	Compliant
Canada	DSL	Compliant
China	IECSC	Compliant
Europe	REACH	See REACH Compliance Statement
Japan	ENCS	Compliant
Korea	KECI	Compliant
New Zealand	NZIoC	Compliant
Philippines	PICCS	Compliant
United States of America	TSCA	Compliant

SECTION 16. OTHER INFORMATION

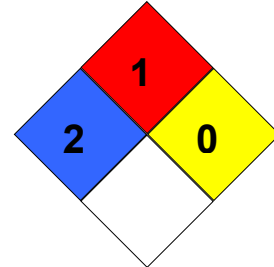
Further information

HMIS Classification

: Health Hazard: 2
Chronic Health Hazard: *
Flammability: 1
Physical hazards: 0

2*	1	0	
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NFPA Classification : Health Hazard: 2
Fire Hazard: 1
Instability: 0



Other Information

HMIS rating scale (0 = minimal hazard; 4 = severe hazard)

NFPA rating scale (0 = minimal hazard; 4 = severe hazard)

Material safety datasheet sections which have been updated:

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Disclaimer

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Information is correct to the best of our knowledge at the date of the SDS publication.

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