GPS Safety Summary

Substance Name:

Diethylamine

1. General Statement

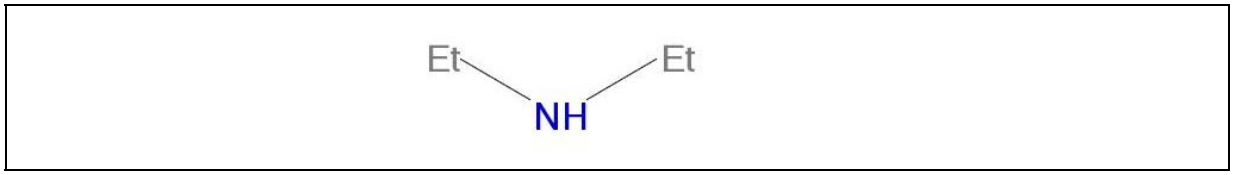
Diethylamine is a colourless liquid completely soluble in water. It is an amine commonly named DEA. It is a highly flammable liquid and a corrosive product.

The substance is mainly used as intermediate in the agrochemical and pharmaceutical industries and in formulations.

DEA is manufactured, used and formulated within industrial settings.

2. Chemical Identity

Name:	Diethylamine
Brand names:	DEA
Chemical name (IUPAC):	N-ethylethanamine
CAS number(s):	109-89-7
EC number:	203-716-3
Molecular formula:	$C_4H_{11}N$
Structure:	



3. Use and applications

The substance is mainly used as intermediate in the agrochemical and pharmaceutical industries and in formulations.

4. Physical / Chemical properties

Diethylamine is a highly flammable liquid organic substance having the following characteristics and physical–chemical properties:

Property	Value
Physical state	liquid at 20°C and 1013 hPa
Colour	clear - colourless
Odour	strong, ammoniacal
Molecular weight	73.14 g/mol

Density	0.71 g/cm^3 at 20°C
Vapour pressure	316 hPa at 25°C
Freezing / boiling points	-50°C / 55°C at 1013 hPa
Flammability	Highly flammable liquid and vapour
Flash point	-28°C
Self-ignition temperature	312°C at 1013 hPa
Explosive / oxidizing properties	Not relevant based on its structure
Water solubility	completely soluble at 25 °C
Dissociation constant (pK_a)	11.09 at 20°C
Octanol-water partition coefficient (Log K_{ow})	0.58 at 20°C

5. Health Effects

Effect Assessment	Result
Acute Toxicity Oral / inhalation / dermal	Harmful by oral and inhalation routes and toxic by dermal route
Irritation / corrosion Skin / eye/ respiratory tract	Corrosive for the skin and the eyes and irritating for the respiratory tract
Sensitisation	Not a skin sensitizer
Toxicity after repeated exposure Oral / inhalation / dermal	Inhalation studies did not suggest a significant systemic toxicity following repeated exposure
Genotoxicity / Mutagenicity	No evidence of genetic toxicity
Carcinogenicity	Studies did not suggest a carcinogenic potential
Reproductive / Developmental Toxicology	Studies with the substance and with analogue substances did not suggest toxic effects on the fertility and the development

6. Environmental Effects

The potential of diethylamine for bioaccumulation is low. This product will not persist in the environment. It is toxic to aquatic organisms.

Effect Assessment	Result
Aquatic Toxicity	Toxic to aquatic organisms

Fate and behaviour	Result
Biodegradation	Ready biodegradable
Other degradation (optional)	
Bioaccumulation potential	Not expected to bioaccumulate
PBT / vPvB conclusion	Not considered as PBT* or vPvB**

*: Persistent, Bioaccumulative and Toxic (PBT)
**: very Persistent and very Bioaccumulative (vPvB)

7. Exposure

7.1 Human health

Diethylamine is manufactured, used and formulated within industrial settings.
The primary routes of industrial exposure of diethylamine (DEA) are skin contact and inhalation, ingestion is not anticipated route of exposure. Workers may be exposed during cleaning, maintenance, transfer, sampling and analysis.

Based on the risk assessment, the exposure can be kept at a safe level (strictly below occupational exposure limits, when applied) when activities are carried out under conditions recommended in the Extended Safety Data Sheet (see Chap. 8 and Exposure Scenarios).
Procedures, controls, suitable collective and personal risk management measures, good industrial hygiene practices and risk and communication through appropriate training of workers should be implemented.

In case of exposure to the undiluted substance, workers should follow the first aid measures recommended in Safety Data Sheet.

7.2 Environment

DEA is manufactured and used in continuous or batch processes within industrial settings.

All industrial aqueous releases that may contain the substance must be treated to avoid any exposure to the environment.
Disposal, treatment or recycling of industrial waste must comply with applicable regulations to preserve the environment.

Please see chap 6 of the Safety Data Sheet regarding environmental precautions.

8. Risk Management recommendations

<table>
<tr><th colspan="3">Human health measures</th></tr>
<tr><td>Organizational</td><td colspan="2">Collect the latest available Safety Data Sheet.
Implement good basic standards of occupational hygiene.
Ensure operatives are well informed of the hazards and trained to minimise exposures.
Handle and store according to the indications of the Safety Data Sheet.</td></tr>
<tr><td>Engineering controls</td><td colspan="2">Provide appropriate local exhaust ventilation at points of emission.
Ensure that eye- and handwash stations and safety showers are close to workstation locations.</td></tr>
<tr><td rowspan="4">Protection</td><td>Eye/Face protection:</td><td>Safety glasses with side-shields</td></tr>
<tr><td>Skin and body protection:</td><td>Protective suit - boots</td></tr>
<tr><td>Hand protection:</td><td>Polyvinylchloride – neoprene rubber, tested to EN374:1</td></tr>
<tr><td>Respiratory protection:</td><td>Respirator if ventilation insufficient
Mask with specific cartridge (organic vapours) Recommended Filter type: AX</td></tr>
<tr><th colspan="3">Environment protective measures</th></tr>
<tr><td colspan="3">Do not release into the environment. Do not let product enter drains.
Use waste water treatment systems. Do not spread sludge to soil.</td></tr>
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9. Regulatory Information / Classification and Labelling

9.1 Regulatory Information

This substance has been registered under:

— EU Regulation EC 1907/2006 (REACH)

9.2 Classification and labelling

Under GHS substances are classified according to their physical, health, and environmental hazards. The hazards are communicated via specific labels and the eSDS. GHS attempts to standardize hazard communication so that the intended audience (workers, consumers, transport workers, and emergency responders) can better understand the hazards of the chemicals in use. Substances registered for REACH are classified according CLP (EC) 1272/2008, implementation of the GHS in the European Union.

Classification	
According to REGULATION (EC) no 1272/2008: — Flammable liquids: Category 2 — Acute toxicity – Oral: Category 4 — Acute toxicity – Dermal: Category 3 — Acute toxicity – Inhalation: Category 4 — Skin corrosion: Category 1A — Serious eye damage: Category 1 — Specific target organ toxicity - single exposure (inhalation): Category 3	
Signal word	
Danger	
Pictogram	
— GHS02: flame	
— GHS05: corrosion	
— GHS06: skull and crossbones	
Hazard statement	
— H225: Highly flammable liquid and vapour. — H302: Harmful if swallowed. — H311: Toxic in contact with skin. — H332: Harmful if inhaled. — H314: Causes severe skin burns and eye damage. — H335: May cause respiratory irritation.	
Alternative classification according to Globally Harmonized System (GHS)	
— Flammable liquids: Category 2, H225: Highly flammable liquid and vapour. — Acute toxicity – Oral: Category 4, H302: Harmful if swallowed.	

- Acute toxicity – Dermal: Category 3, H311: Toxic in contact with skin.
- Acute toxicity – Inhalation: Category 4, H332: Harmful if inhaled.
- Skin corrosion: Category 1A, H314: Causes severe skin burns and eye damage.
- Serious eye damage: Category 1, H314: Causes severe skin burns and eye damage.
- Specific target organ toxicity - single exposure (inhalation): Category 3, H335: May cause respiratory irritation.
- Acute aquatic toxicity, Category 2, H401: Toxic to aquatic life

10. Contact Information within Company

For further information on this substance or product safety summary in general, please contact:

- arkema-thiochem-reach-uses@arkema.com
- **ICCA portal where the GPS Safety Summary is posted**: http://www.icca-chem.org/en/Home/ICCA-initiatives/global-product-strategy/

11. Date of Issues / Revision

- Date of issue: 2014/07/10
- Date of revision:

12. Disclaimer

The information contained in this paper is intended as advice only and whilst the information is provided in utmost good faith and has been based on the best information currently available, is to be relied upon at the user's own risk.

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