

SAFETY DATA SHEET

according to the Global Harmonized System

ETHYLENEDIAMINE (EDA)

Version 4

Revision Date 03.06.2016

Print Date 16.11.2017

IN / EN

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product Information

Trade name : ETHYLENEDIAMINE (EDA)

Use of the Substance/Mixture : Specific use(s): Various industrial applications

Company : Akzo Nobel
Functional Chemicals AB
SE 444 85 Stenungsund
Sweden

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2. HAZARDS IDENTIFICATION

GHS Classification

Flammable liquids, Category 3
Acute toxicity, Category 4, Oral
Acute toxicity, Category 4, Inhalation
Acute toxicity, Category 3, Dermal
Skin corrosion/irritation, Sub-category 1B
Serious eye damage/eye irritation, Category 1
Respiratory sensitisation, Sub-category 1B
Skin sensitisation, Sub-category 1B
Acute aquatic toxicity, Category 3
Chronic aquatic toxicity, Category 3

GHS-Labeling

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Hazard pictograms	:	   
Signal word	:	Danger
Hazard statements	:	H226 Flammable liquid and vapour. H302 + H332 Harmful if swallowed or if inhaled H311 Toxic in contact with skin. H314 Causes severe skin burns and eye damage. H317 May cause an allergic skin reaction. H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled. H412 Harmful to aquatic life with long lasting effects.
Precautionary statements	:	Prevention: P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P261 Avoid breathing mist, vapours or spray. P280 Wear protective gloves/ eye protection/ face protection. P284 Wear respiratory protection. Response: P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell. P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor. P342 + P311 If experiencing respiratory symptoms: Call a POISON CENTER/doctor.

Other hazards which do not result in classification

No further data available.

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3. COMPOSITION/INFORMATION ON INGREDIENTS

Index-No. : 612-006-00-6

EINECS-No. : 203-468-6

Hazardous components

Chemical name	CAS-No.	GHS Classification	Concentration[%]
Ethylenediamine	107-15-3	Flam. Liq. 3; H226 Acute Tox. 4; H302 Acute Tox. 4; H332 Acute Tox. 3; H311 Skin Corr./Irrit. 1B; H314 Eye Dam./Irrit. 1; H318 Resp. Sens. 1B; H334 Skin Sens. 1B; H317 Aquatic Acute 3; H402 Aquatic Chronic 3; H412	90 - 100

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

- General advice : Immediate medical attention is required.
Move out of dangerous area.
Show this safety data sheet to the doctor in attendance.
Symptoms of poisoning may appear several hours later.
- Inhalation : If breathed in, move person into fresh air.
Consult a physician after significant exposure.
- Skin contact : Take off contaminated clothing and shoes immediately.
Rinse immediately with plenty of water.
Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and with difficulty.
Take victim immediately to hospital.
- Eye contact : Rinse with plenty of water.
Get medical attention immediately. Continue to rinse during transport.
Remove contact lenses.
Protect unharmed eye.
Keep eye wide open while rinsing.
Small amounts splashed into eyes can cause irreversible tissue damage and blindness.
- Ingestion : Clean mouth with water and drink afterwards plenty of water.
Never give anything by mouth to an unconscious person.
Take victim immediately to hospital.
Do not induce vomiting! May cause chemical burns in mouth and throat.

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Notes to physician

- Symptoms : The symptoms and effects are as expected from the hazards as shown in section 2. No specific product related symptoms are known.
- Treatment : Treat symptomatically.

5. FIREFIGHTING MEASURES

- Suitable extinguishing media : Carbon dioxide (CO₂)
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
- Specific hazards during firefighting / Specific hazards arising from the chemical : Water spray may be ineffective unless used by experienced firefighters.
Do not allow run-off from fire fighting to enter drains or water courses.
- Combustion products : Carbon oxides
Nitrogen oxides (NO_x)
- Special protective equipment for firefighters : In the event of fire, wear self-contained breathing apparatus.
- Further information : Use water spray to cool unopened containers.
Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
For safety reasons in case of fire, cans should be stored separately in closed containments.

6. ACCIDENTAL RELEASE MEASURES

- Personal precautions : Use personal protective equipment.
Wear respiratory protection.
Ensure adequate ventilation.
Remove all sources of ignition.
Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
- Environmental precautions : Prevent product from entering drains.
If the product contaminates rivers and lakes or drains inform respective authorities.
- Methods for cleaning up /
Methods for containment : Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

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Additional advice : For personal protection see section 8.

7. HANDLING AND STORAGE

Handling

Advice on safe handling : Persons with a history of skin sensitisation problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.

For personal protection see section 8.
Avoid formation of aerosol.
Do not breathe vapours or spray mist.
Avoid contact with skin, eyes and clothing.
Smoking, eating and drinking should be prohibited in the application area.
Provide sufficient air exchange and/or exhaust in work rooms.
Container may be opened only under exhaust ventilation hood.
Open drum carefully as content may be under pressure.
Dispose of rinse water in accordance with local and national regulations.

Advice on protection against fire and explosion : Avoid formation of aerosol.
Keep away from sources of ignition - No smoking.
No sparking tools should be used.
Take measures to prevent the build up of electrostatic charge.

Storage

Requirements for storage areas and containers : Prevent unauthorized access.
No smoking.
Keep container tightly closed in a dry and well-ventilated place.
Reacts with copper, aluminium, zinc and their alloys.
Electrical installations / working materials must comply with the technological safety standards.

Other data : No decomposition if stored and applied as directed.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value	Control parameters	Update	Basis	Form of exposure
Ethylenediamine	107-15-3	TWA	10 ppm	2007-01-01	ACGIH	
	Further information	:	A4: Not classifiable as a human carcinogen Skin: Danger of cutaneous absorption			
		TWA	10 ppm 25 mg/m ³	2013-10-08	NIOSH REL	

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		TWA	10 ppm 25 mg/m ³	1997-08-04	OSHA Z-1	
	Further information	:	(b): The value in mg/m ³ is approximate.			
		TWA	10 ppm 25 mg/m ³	1989-01-19	OSHA P0	
		PEL	10 ppm 25 mg/m ³	2014-11-26	CAL PEL	

ACGIH: American Conference of Governmental Industrial Hygienists
BEI: Biological Exposure Index
MAC: Maximum Allowable Concentration
NIOSH: National Institute for Occupational Safety and Health
OEL: OEL: Occupational exposure limit.
STEL: Short term exposure limit
TWA: Time Weighted Average

Engineering controls

Effective exhaust ventilation system

Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protective equipment

Respiratory protection : In the case of vapour or aerosol formation use a respirator with an approved filter.
Wear full face mask supplied with:
Gas cartridge K (ammonia, green).

Hand protection : butyl-rubber

Eye protection : Safety glasses with side-shields conforming to EN166

Skin and body protection : Protective suit

Hygiene measures : Avoid contact with skin, eyes and clothing.
When using do not eat or drink.
When using do not smoke.
Wash hands before breaks and immediately after handling the product.
Wash contaminated clothing before re-use.

Environmental exposure controls

General advice : Prevent product from entering drains.
If the product contaminates rivers and lakes or drains inform respective authorities.

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9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form	: viscous liquid
Colour	: colourless light yellow
Odour	: ammoniacal
Odour Threshold	: No data available

Safety data

pH	: 12.8 at 25 % solution
Melting point/range	: 11 °C at 1,013 hPa
Boiling point/boiling range	: 117 °C at 1,013 hPa
Flash point	: 38 °C at 1,013 hPa Method: closed cup
Ignition temperature	: > 300 °C
Evaporation rate	: No data available
Flammability (solid, gas)	: Not applicable
Flammability (liquids)	: Flammable liquid and vapour.
Lower explosion limit	: 2 %(V)
Upper explosion limit	: 17 %(V)
Vapour pressure	: 17.3 hPa at 26.6 °C
Relative vapour density	: 2.1
Density	: 895 kg/m ³ at 20 °C
Relative density	: 897 at 20 °C
Water solubility	: completely miscible
Solubility in other solvents	: Very soluble in ethanol and benzene.
Partition coefficient: n-octanol/water	: log Pow: -1.6 at 20 °C

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Auto-ignition temperature	: 385 - 405 °C at 1,013 hPa
Decomposition temperature	: No data available
Viscosity, dynamic	: 1.265 mPa.s at 25 °C
Viscosity, kinematic	: No data available
Explosive properties	: Not explosive
Oxidizing properties	: The substance or mixture is not classified as oxidizing.

This safety datasheet only contains information relating to safety and does not replace any product information or product specification.

10. STABILITY AND REACTIVITY

Conditions to avoid	: Heat, flames and sparks.
Materials to avoid	: Reacts with copper, aluminium, zinc and their alloys. Strong acids and oxidizing agents Halogenated compounds
Hazardous decomposition products	: Nitrogen oxides (NO _x)
Thermal decomposition	: No data available
Reactivity	: Stable under normal conditions.
Chemical stability	: Stable under recommended storage conditions.
Hazardous reactions	: Heating can release hazardous gases.

11. TOXICOLOGICAL INFORMATION

Product information:

Hazard Summary

Inhalation	: Inhalation of aerosols may cause irritation to mucous membranes. Thermal decomposition can lead to release of irritating gases and vapours. Harmful if inhaled. May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Skin	: Symptoms may be delayed. Toxic in contact with skin. May cause an allergic skin reaction. Causes severe skin burns.

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Eyes : Causes serious eye damage.

Ingestion : Harmful if swallowed.
Causes burns.

Toxicology Assessment

Further information : Solvents may degrease the skin.

Toxicology data for the components:

Test result

Component: Ethylenediamine

Acute oral toxicity : LD50: > 300 - 2,000 mg/kg
Species: Rat

Acute inhalation toxicity : LC50 (Rat): > 10 - 20 mg/l
Exposure time: 4 h
Test atmosphere: vapour

Acute dermal toxicity : LD50: > 200 - 1,000 mg/kg
Species: Rabbit

Skin irritation : Result: Causes burns.

Sensitisation : Result: The product is a skin sensitiser, sub-category 1B.
Result: The product is a respiratory sensitiser, sub-category 1B.

Germ cell mutagenicity
Genotoxicity in vitro : Result: Not mutagenic.
Positive results were obtained in some in vitro tests.

Genotoxicity in vivo : Result: No evidence of genotoxic effects in vivo.

12. ECOLOGICAL INFORMATION

Product information:

Ecotoxicology Assessment

Additional ecological information : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Harmful to aquatic life with long lasting effects.

Test result

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Elimination information (persistence and degradability)

- Bioaccumulation : Not expected considering the low log Pow value.
- Mobility : Adsorption to solid soil phase is possible.
- Biodegradability : Result: Readily biodegradable

Further information on ecology

- Biochemical Oxygen Demand (BOD) : No data available

Components:

Ecotoxicology Assessment

Component: Ethylenediamine

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

Test result

Component: Ethylenediamine

Ecotoxicity effects

- Toxicity to fish : LC50: > 100 mg/l
Exposure time: 96 h
Species: Poecilia reticulata (guppy)
- Toxicity to daphnia and other aquatic invertebrates : EC50: > 10 - 100 mg/l
Exposure time: 48 h
Species: Daphnia magna (Water flea)
- Toxicity to algae : EC50: > 100 mg/l
Exposure time: 72 h
Species: Pseudokirchneriella subcapitata (green algae)
- Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: > 0.1 - 1 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)

Elimination information (persistence and degradability)

- Bioaccumulation : Not expected considering the low log Pow value.
- Mobility : Adsorption to solid soil phase is possible., Groundwater contamination is unlikely., Transport to air is not expected.
- Biodegradability : Result: Readily biodegradable

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>60% BOD, 28 days, Closed Bottle Test (OECD 301D).

Further information on ecology

Biochemical Oxygen Demand (BOD) : No data available

13. DISPOSAL CONSIDERATIONS

Product : The product should not be allowed to enter drains, water courses or the soil.
Do not contaminate ponds, waterways or ditches with chemical or used container.
Hazardous waste
Dispose of contents/container in accordance with local regulation.

Contaminated packaging : Empty remaining contents.
Dispose of as unused product.
Do not burn, or use a cutting torch on, the empty drum.

14. TRANSPORT INFORMATION

International Regulation

UNRTDG

UN number : UN 1604
Proper shipping name : ETHYLENEDIAMINE
Class : 8
Subsidiary risk : 3
Packing group : II
Labels : 8 (3)
Environmentally hazardous : no

IATA-DGR

UN/ID No. : UN 1604
Proper shipping name : Ethylenediamine
Class : 8
Subsidiary risk : 3
Packing group : II
Labels : 8 (3)
Packing instruction (cargo aircraft) : 855
Packing instruction (passenger aircraft) : 851
Packing instruction (LQ) : Y840
Environmentally hazardous : no

IMDG-Code

UN number : UN 1604
Proper shipping name : ETHYLENEDIAMINE
Class : 8

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Subsidiary risk : 3
Packing group : II
Labels : 8 (3)
EmS Code : F-E, S-C
Marine pollutant : no

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

15. REGULATORY INFORMATION

Notification status

TSCA : YES. All chemical substances in this product are either listed on the TSCA Inventory or in compliance with a TSCA Inventory exemption.
DSL : YES. All components of this product are on the Canadian DSL
AICS : YES. On the inventory, or in compliance with the inventory
NZIoC : YES. On the inventory, or in compliance with the inventory
ENCS : YES. On the inventory, or in compliance with the inventory
ISHL : YES. On the inventory, or in compliance with the inventory
KECI : YES. On the inventory, or in compliance with the inventory
PICCS : YES. On the inventory, or in compliance with the inventory
IECSC : YES. On the inventory, or in compliance with the inventory

For explanation of abbreviation see section 16.

16. OTHER INFORMATION

Full text of H-Statements

H226 : Flammable liquid and vapour.
H302 : Harmful if swallowed.
H311 : Toxic in contact with skin.
H314 : Causes severe skin burns and eye damage.
H317 : May cause an allergic skin reaction.
H318 : Causes serious eye damage.
H332 : Harmful if inhaled.
H334 : May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H402 : Harmful to aquatic life.
H412 : Harmful to aquatic life with long lasting effects.

Full text of other abbreviations

AICS - Australian Inventory of Chemical Substances; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; CPR - Controlled Products Regulations; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO -

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International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative; WHMIS - Workplace Hazardous Materials Information System

Further information

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