

# Safety data sheet

Safe Work Australia - Code of Practice



## Ethylenediamine ≥99,5 %, for synthesis

article number: **4218**  
Version: **GHS 2.0 en**  
Replaces version of: 2016-04-08  
Version: (GHS 1)

date of compilation: 2016-04-08  
Revision: 2020-11-05

## SECTION 1: Identification of the substance/mixture and of the company/undertaking

### 1.1 Product identifier

Identification of the substance	<b>Ethylenediamine</b> ≥99,5 %, for synthesis
Article number	4218
Registration number (REACH)	01-2119480383-37-xxxx
Index No	612-006-00-6
EC number	203-468-6
CAS number	107-15-3

### 1.2 Relevant identified uses of the substance or mixture and uses advised against

**Identified uses:** laboratory chemical  
laboratory and analytical use

### 1.3 Details of the supplier of the safety data sheet

Carl Roth GmbH + Co KG  
Schoemperlenstr. 3-5  
D-76185 Karlsruhe  
Germany

**Telephone:** +49 (0) 721 - 56 06 0  
**Telefax:** +49 (0) 721 - 56 06 149  
**e-mail:** [sicherheit@carlroth.de](mailto:sicherheit@carlroth.de)  
**Website:** [www.carlroth.de](http://www.carlroth.de)

Competent person responsible for the safety data sheet: Department Health, Safety and Environment

**e-mail (competent person):** [sicherheit@carlroth.de](mailto:sicherheit@carlroth.de)

### 1.4 Emergency telephone number

Name	Street	Postal code/ city	Telephone	Website
NSW Poisons Information Centre Childrens Hospital	Hawkesbury Road	2145 Westmead, NSW	131126	

Emergency information service

**Poison Centre Munich: +49/(0)89 19240**

## SECTION 2: Hazards identification

### 2.1 Classification of the substance or mixture

**Classification acc. to GHS**

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Classification acc. to GHS			
Section	Hazard class	Hazard class and category	Hazard statement
2.6	flammable liquid	(Flam. Liq. 3)	H226
3.1O	acute toxicity (oral)	(Acute Tox. 4)	H302
3.1D	acute toxicity (dermal)	(Acute Tox. 3)	H311
3.1I	acute toxicity (inhal.)	(Acute Tox. 4)	H332
3.2	skin corrosion/irritation	(Skin Corr. 1)	H314
3.3	serious eye damage/eye irritation	(Eye Dam. 1)	H318
3.4R	respiratory sensitisation	(Resp. Sens. 1)	H334
3.4S	skin sensitisation	(Skin Sens. 1)	H317

## 2.2 Label elements

### Labelling GHS

#### Signal word

**Danger**

#### Pictograms

GHS02, GHS05,  
GHS06, GHS08



#### 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

#### Precautionary statements

##### Precautionary statements - prevention

P210	Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P260	Do not breathe dusts or mists.
P280	Wear protective gloves/protective clothing.

##### Precautionary statements - response

P302+P352	IF ON SKIN: Wash with plenty of soap and water.
P303+P361+P353	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P370+P378	In case of fire: Use sand, carbon dioxide or powder extinguisher for extinction.

##### Precautionary statements - storage

P403+P235	Store in a well-ventilated place. Keep cool.
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### Labelling of packages where the contents do not exceed 125 ml

Signal word: **Danger**

Symbol(s)



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.
P260	Do not breathe dusts or mists.
P280	Wear protective gloves/protective clothing.
P302+P352	IF ON SKIN: Wash with plenty of soap and water.
P303+P361+P353	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

### 2.3 Other hazards

There is no additional information.

## SECTION 3: Composition/information on ingredients

### 3.1 Substances

Name of substance	Ethylenediamine
Index No	612-006-00-6
Registration number (REACH)	01-2119480383-37-xxxx
EC number	203-468-6
CAS number	107-15-3
Molecular formula	C <sub>2</sub> H <sub>8</sub> N <sub>2</sub>
Molar mass	60.1 g/mol

#### Substance of Very High Concern (SVHC)

Name of substance	CAS No	Wt%	Listed in	Remarks
Ethylenediamine	107-15-3	100	Candidate list	RSP (57f-hh)

#### Legend

candidate list  
RSP (57f-hh) Substances meeting the criteria referred to in Article 57 and for eventual inclusion in Annex XIV  
Respiratory sensitising properties (article 57(f) - human health)

## SECTION 4: First aid measures

### 4.1 Description of first aid measures



#### General notes

Take off immediately all contaminated clothing. Self-protection of the first aider.

#### Following inhalation

Provide fresh air. If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. Medical treatment necessary.

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### Following skin contact

After contact with skin, wash immediately with plenty of water. Immediate medical treatment required because corrosive injuries that are not treated are hard to cure. In case of skin reactions, consult a physician.

### Following eye contact

In case of contact with eyes flush immediately with plenty of flowing water for 10 to 15 minutes holding eyelids apart and consult an ophthalmologist. Protect uninjured eye.

### Following ingestion

Rinse mouth with water (only if the person is conscious). Call a physician immediately. If swallowed danger of perforation of the esophagus and the stomach (strong corrosive effects).

## 4.2 Most important symptoms and effects, both acute and delayed

Corrosion, Vomiting, Risk of blindness, Gastric perforation, Risk of serious damage to eyes, Allergic reactions

## 4.3 Indication of any immediate medical attention and special treatment needed

none

## SECTION 5: Firefighting measures

### 5.1 Extinguishing media



#### Suitable extinguishing media

Co-ordinate fire-fighting measures to the fire surroundings  
water spray, foam, dry extinguishing powder, carbon dioxide (CO<sub>2</sub>)

#### Unsuitable extinguishing media

water jet

### 5.2 Special hazards arising from the substance or mixture

Combustible. Vapours can form explosive mixtures with air.

#### Hazardous combustion products

In case of fire may be liberated: nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>)

### 5.3 Advice for firefighters

Fight fire with normal precautions from a reasonable distance. Wear self-contained breathing apparatus. Wear full chemical protective clothing.

## SECTION 6: Accidental release measures

### 6.1 Personal precautions, protective equipment and emergency procedures



#### For non-emergency personnel

Wearing of suitable protective equipment (including personal protective equipment referred to under Section 8 of the safety data sheet) to prevent any contamination of skin, eyes and personal clothing. Do not breathe vapour/spray. Avoidance of ignition sources.

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### 6.2 Environmental precautions

Keep away from drains, surface and ground water. Explosive properties.

### 6.3 Methods and material for containment and cleaning up

#### Advice on how to contain a spill

Covering of drains.

#### Advice on how to clean up a spill

Absorb with liquid-binding material (sand, diatomaceous earth, acid- or universal binding agents).

#### Other information relating to spills and releases

Place in appropriate containers for disposal. Ventilate affected area.

### 6.4 Reference to other sections

Hazardous combustion products: see section 5. Personal protective equipment: see section 8. Incompatible materials: see section 10. Disposal considerations: see section 13.

## SECTION 7: Handling and storage

### 7.1 Precautions for safe handling

Provision of sufficient ventilation. Handle and open container with care. Clear contaminated areas thoroughly.

#### • Measures to prevent fire as well as aerosol and dust generation



Keep away from sources of ignition - No smoking.

Take precautionary measures against static discharge.

#### Advice on general occupational hygiene

Thorough skin-cleansing after handling the product. When using do not smoke.

### 7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed.

#### Incompatible substances or mixtures

Observe hints for combined storage.

#### Consideration of other advice

Store locked up. Ground/bond container and receiving equipment.

#### • Ventilation requirements

Use local and general ventilation.

#### • Specific designs for storage rooms or vessels

Recommended storage temperature: 15 – 25 °C.

### 7.3 Specific end use(s)

No information available.

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### SECTION 8: Exposure controls/personal protection

#### 8.1 Control parameters

##### National limit values

##### Occupational exposure limit values (Workplace Exposure Limits)

Country	Name of agent	CAS No	Notation	Identifier	TWA [ppm]	TWA [mg/m <sup>3</sup> ]	STEL [ppm]	STEL [mg/m <sup>3</sup> ]	Ceiling-C [ppm]	Ceiling-C [mg/m <sup>3</sup> ]	Source
AU	ethylenediamine (1,2-diaminoethane)	107-15-3		WES	10	25					WES

##### Notation

Ceiling-C Ceiling value is a limit value above which exposure should not occur  
 STEL Short-term exposure limit: a limit value above which exposure should not occur and which is related to a 15-minute period (unless otherwise specified)  
 TWA Time-weighted average (long-term exposure limit): measured or calculated in relation to a reference period of 8 hours time-weighted average (unless otherwise specified)

##### Relevant DNELs/DMELs/PNECs and other threshold levels

##### • human health values

Endpoint	Threshold level	Protection goal, route of exposure	Used in	Exposure time
DNEL	25 mg/m <sup>3</sup>	human, inhalatory	worker (industry)	chronic - systemic effects
DNEL	3.6 mg/kg bw/day	human, dermal	worker (industry)	chronic - systemic effects

##### • environmental values

Endpoint	Threshold level	Environmental compartment	Exposure time
PNEC	0.167 mg/l	water	intermittent release
PNEC	0.016 mg/l	freshwater	short-term (single instance)
PNEC	0.002 mg/l	marine water	short-term (single instance)
PNEC	0.5 mg/l	sewage treatment plant (STP)	short-term (single instance)
PNEC	7.68 mg/kg	freshwater sediment	short-term (single instance)
PNEC	0.768 mg/kg	marine sediment	short-term (single instance)
PNEC	4.36 mg/kg	soil	short-term (single instance)

#### 8.2 Exposure controls

##### Individual protection measures (personal protective equipment)

##### Eye/face protection



Use safety goggle with side protection. Wear face protection.

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### Skin protection



- **hand protection**

Wear suitable gloves. Chemical protection gloves are suitable, which are tested according to EN 374. Check leak-tightness/impermeability prior to use. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves. The times are approximate values from measurements at 22 ° C and permanent contact. Increased temperatures due to heated substances, body heat etc. and a reduction of the effective layer thickness by stretching can lead to a considerable reduction of the breakthrough time. If in doubt, contact manufacturer. At an approx. 1.5 times larger / smaller layer thickness, the respective breakthrough time is doubled / halved. The data apply only to the pure substance. When transferred to substance mixtures, they may only be considered as a guide.

- **type of material**

Butyl caoutchouc (butyl rubber)

- **material thickness**

0,7mm.

- **breakthrough times of the glove material**

>480 minutes (permeation: level 6)

### Splash protection - Protective gloves

- **Type of material**

NBR (Nitrile rubber).

- **Material thickness**

0,4 mm.

- **Breakthrough times of the glove material**

>30 minutes (permeation: level 2).

- **other protection measures**

Take recovery periods for skin regeneration. Preventive skin protection (barrier creams/ointments) is recommended.

### Respiratory protection



Respiratory protection necessary at: Aerosol or mist formation. Type: A (against organic gases and vapours with a boiling point of > 65 °C , colour code: Brown).

### Environmental exposure controls

Keep away from drains, surface and ground water.

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### SECTION 9: Physical and chemical properties

#### 9.1 Information on basic physical and chemical properties

##### Appearance

Physical state	liquid (fluid)
Colour	colourless
Odour	amine
Odour threshold	no data available

##### Other physical and chemical parameters

pH (value)	12.2 (water: 100 g/l, 20 °C)
Melting point/freezing point	11.1 °C
Initial boiling point and boiling range	117.1 °C at 1,013 hPa
Flash point	42 °C at 1,013 hPa
Evaporation rate	no data available
Flammability (solid, gas)	not relevant (fluid)
<u>Explosive limits</u>	
• lower explosion limit (LEL)	2.5 vol%
• upper explosion limit (UEL)	16.3 vol%
Explosion limits of dust clouds	not relevant
Vapour pressure	12 hPa at 20 °C 22 hPa at 30 °C 70 hPa at 50 °C
Density	0.897 g/cm <sup>3</sup> at 20 °C (ECHA)
Vapour density	this information is not available
Bulk density	Not applicable
Relative density	this information is not available
<u>Solubility(ies)</u>	
Water solubility	1,000 g/l
<u>Partition coefficient</u>	
n-octanol/water (log KOW)	-1.62 (pH value: >12, 25 °C) (ECHA)
Soil organic carbon/water (log KOC)	3.679 (ECHA)
Auto-ignition temperature	405 °C - ECHA
Decomposition temperature	no data available
Viscosity	
• dynamic viscosity	1.265 – 1.725 mPa s at 25 °C
Explosive properties	Shall not be classified as explosive.
Oxidising properties	none



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### 9.2 Other information

## SECTION 10: Stability and reactivity

### 10.1 Reactivity

Risk of ignition. In case of warming: Vapours can form explosive mixtures with air.

### 10.2 Chemical stability

The material is stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

### 10.3 Possibility of hazardous reactions

Violent reaction with: Aldehydes, Alcohols, Halogenated hydrocarbons, Perchlorates,  
Exothermic reaction with: Acrylic acid, Acetic acid, Acetic anhydride, Oxidisers, Acids, Carbon disulfide, Hydrochloric gas

### 10.4 Conditions to avoid

There are no specific conditions known which have to be avoided.

### 10.5 Incompatible materials

aluminium, iron, copper, bronze, brass, zinc

### 10.6 Hazardous decomposition products

Hazardous combustion products: see section 5.

## SECTION 11: Toxicological information

### 11.1 Information on toxicological effects

#### Acute toxicity

Exposure route	Endpoint	Value	Species	Source
oral	LD50	866 mg/kg	rat	ECHA
inhalation: vapour	LC50	14.7 mg/l/4h	rat	ECHA
dermal	LD50	560 mg/kg	rabbit	ECHA

#### Skin corrosion/irritation

Causes severe burns.

#### Serious eye damage/eye irritation

Causes serious eye damage.

#### Respiratory or skin sensitisation

May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction. May cause sensitization by skin contact. May cause sensitization by inhalation.

#### Summary of evaluation of the CMR properties

Shall not be classified as germ cell mutagenic, carcinogenic nor as a reproductive toxicant

- **Specific target organ toxicity - single exposure**

Shall not be classified as a specific target organ toxicant (single exposure).

- **Specific target organ toxicity - repeated exposure**

Shall not be classified as a specific target organ toxicant (repeated exposure).

#### Aspiration hazard

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Shall not be classified as presenting an aspiration hazard.

### Symptoms related to the physical, chemical and toxicological characteristics

- **If swallowed**

If swallowed danger of perforation of the esophagus and the stomach (strong corrosive effects)

- **If in eyes**

causes burns, Causes serious eye damage, risk of blindness

- **If inhaled**

data are not available

- **If on skin**

causes severe burns, causes poorly healing wounds

### Other information

Liver and kidney damage

## SECTION 12: Ecological information

### 12.1 Toxicity

acc. to 1272/2008/EC: Shall not be classified as hazardous to the aquatic environment.

#### Aquatic toxicity (acute)

Endpoint	Value	Species	Source	Exposure time
LC50	640 mg/l	fish	ECHA	96 h
EC50	16.7 mg/l	aquatic invertebrates	ECHA	48 h
ErC50	645 mg/l	algae	ECHA	72 h

#### Aquatic toxicity (chronic)

Endpoint	Value	Species	Source	Exposure time
NOEC	>10 mg/l	fish	ECHA	28 d
growth (EbCx) 10%	0.5 mg/l	microorganisms	ECHA	2 h

### 12.2 Process of degradability

The substance is readily biodegradable.

Theoretical Oxygen Demand with nitrification: 2.462 mg/mg

Theoretical Oxygen Demand: 1.331 mg/mg

Theoretical Carbon Dioxide: 1.465 mg/mg

Process	Degradation rate	Time
biotic/abiotic	94 %	28 d
oxygen depletion	10 %	5 d

### 12.3 Bioaccumulative potential

Does not significantly accumulate in organisms.

n-octanol/water (log KOW)

-1.62 (pH value: >12, 25 °C)

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### 12.4 Mobility in soil

Henry's law constant	0.6 Pa m <sup>3</sup> /mol at 25 °C
The Organic Carbon normalised adsorption coefficient	3.679

### 12.5 Results of PBT and vPvB assessment

Data are not available.

### 12.6 Other adverse effects

Data are not available.

## SECTION 13: Disposal considerations

### 13.1 Waste treatment methods



This material and its container must be disposed of as hazardous waste. Dispose of contents/container in accordance with local/regional/national/international regulations.

#### Sewage disposal-relevant information

Do not empty into drains.

#### Waste treatment of containers/packagings

It is a dangerous waste; only packagings which are approved (e.g. acc. to ADR) may be used.


### 13.2 Relevant provisions relating to waste

The allocation of waste identity numbers/waste descriptions must be carried out according to the EEC, specific to the industry and process.

### 13.3 Remarks

Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities. Please consider the relevant national or regional provisions.

## SECTION 14: Transport information

14.1	UN number	<b>1604</b>
14.2	UN proper shipping name	<b>ETHYLENEDIAMINE</b>
	Hazardous ingredients	Ethylenediamine
14.3	Transport hazard class(es)	
	Class	8 (corrosive substances)
14.4	Packing group	II (substance presenting medium danger)
14.5	Environmental hazards	<b>NONE</b> (non-environmentally hazardous acc. to the dangerous goods regulations)
14.6	Special precautions for user	
	Provisions for dangerous goods (ADR) should be complied within the premises.	
14.7	Transport in bulk according to Annex II of MARPOL and the IBC Code	

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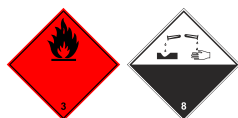
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The cargo is not intended to be carried in bulk.

### 14.8 Information for each of the UN Model Regulations

#### • Transport of dangerous goods by road, rail and inland waterway (ADR/RID/ADN)

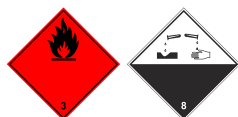
UN number	1604
Proper shipping name	ETHYLENEDIAMINE
Particulars in the transport document	UN1604, ETHYLENEDIAMINE, 8 (3), II, (D/E)
Class	8
Classification code	CF1
Packing group	II
Danger label(s)	8+3



Excepted quantities (EQ)	E2
Limited quantities (LQ)	1 L
Transport category (TC)	2
Tunnel restriction code (TRC)	D/E
Hazard identification No	83
<b>Emergency Action Code</b>	2W

#### • International Maritime Dangerous Goods Code (IMDG)

UN number	1604
Proper shipping name	ETHYLENEDIAMINE
Particulars in the shipper's declaration	UN1604, ETHYLENEDIAMINE, 8 (3), II, 42°C c.c.
Class	8
Subsidiary risk(s)	3
Marine pollutant	-
Packing group	II
Danger label(s)	8+3



Special provisions (SP)	-
Excepted quantities (EQ)	E2
Limited quantities (LQ)	1 L
EmS	F-E, S-C
Stowage category	A
Segregation group	18 - Alkalis

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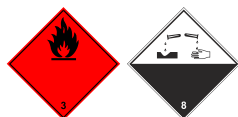


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### • International Civil Aviation Organization (ICAO-IATA/DGR)

UN number	1604
Proper shipping name	Ethylenediamine
Particulars in the shipper's declaration	UN1604, Ethylenediamine, 8 (3), II
Class	8
Subsidiary risk(s)	3
Packing group	II
Danger label(s)	8+3



Excepted quantities (EQ)	E2
Limited quantities (LQ)	0,5 L

## SECTION 15: Regulatory information

### 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

#### National inventories

Substance is listed in the following national inventories:

Country	National inventories	Status
AU	AICS	substance is listed
CA	DSL	substance is listed
CN	IECSC	substance is listed
EU	ECSI	substance is listed
EU	REACH Reg.	substance is listed
JP	CSCL-ENCS	substance is listed
KR	KECI	substance is listed
MX	INSQ	substance is listed
NZ	NZIoC	substance is listed
PH	PICCS	substance is listed
TR	CICR	substance is listed
TW	TCSI	substance is listed
US	TSCA	substance is listed

#### Legend

AICS	Australian Inventory of Chemical Substances
CICR	Chemical Inventory and Control Regulation
CSCL-ENCS	List of Existing and New Chemical Substances (CSCL-ENCS)
DSL	Domestic Substances List (DSL)
ECSI	EC Substance Inventory (EINECS, ELINCS, NLP)
IECSC	Inventory of Existing Chemical Substances Produced or Imported in China
INSQ	National Inventory of Chemical Substances
KECI	Korea Existing Chemicals Inventory
NZIoC	New Zealand Inventory of Chemicals
PICCS	Philippine Inventory of Chemicals and Chemical Substances (PICCS)

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### Legend

REACH Reg. REACH registered substances  
TCSI Taiwan Chemical Substance Inventory  
TSCA Toxic Substance Control Act

## 15.2 Chemical Safety Assessment

No Chemical Safety Assessment has been carried out for this substance.

## SECTION 16: Other information

### Indication of changes (revised safety data sheet)

Section	Former entry (text/value)	Actual entry (text/value)	Safety-relevant
2.1		Classification acc. to GHS: change in the listing (table)	yes
2.1	Remarks: For full text of Hazard- and EU Hazard-statements: see SECTION 16.		yes
2.2		Pictograms: change in the listing (table)	yes
2.2		Hazard statements: change in the listing (table)	yes
2.2		Precautionary statements - prevention: change in the listing (table)	yes
2.2		Precautionary statements - response: change in the listing (table)	yes
2.2		Precautionary statements - storage: change in the listing (table)	yes
2.2		Labelling of packages where the contents do not exceed 125 ml: change in the listing (table)	yes
2.2		Labelling of packages where the contents do not exceed 125 ml: change in the listing (table)	yes
8.1		• environmental values: change in the listing (table)	yes
14.3	Transport hazard class(es)	Transport hazard class(es): class 8 hazard - corrosive substances	yes
14.8	Particulars in the transport document: UN1604, ETHYLENEDIAMINE, (ethylenediamine), 8 (3), II, (D/E)	Particulars in the transport document: UN1604, ETHYLENEDIAMINE, 8 (3), II, (D/E)	yes
14.8	Particulars in the shipper's declaration: UN1604, ETHYLENEDIAMINE, (ethylenediamine), 8 (3), II, 38°C c.c.	Particulars in the shipper's declaration: UN1604, ETHYLENEDIAMINE, 8 (3), II, 42°C c.c.	yes
14.8		Marine pollutant: -	yes
14.8		• International Civil Aviation Organization (ICAO-IATA/DGR)	yes
14.8		UN number: 1604	yes
14.8		Proper shipping name: Ethylenediamine	yes
14.8		Particulars in the shipper's declaration: UN1604, Ethylenediamine, 8 (3), II	yes

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Section	Former entry (text/value)	Actual entry (text/value)	Safety-relevant
14.8		Class: 8	yes
14.8		Subsidiary risk(s): 3	yes
14.8		Packing group: II	yes
14.8		Danger label(s): 8+3	yes
14.8		Danger label(s): change in the listing (table)	yes
14.8		Excepted quantities (EQ): E2	yes
14.8		Limited quantities (LQ): 0,5 L	yes

### Abbreviations and acronyms

Abbr.	Descriptions of used abbreviations
ADN	Accord européen relatif au transport international des marchandises dangereuses par voies de navigation intérieures (European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways)
ADR	Accord européen relatif au transport international des marchandises dangereuses par route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
CAS	Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)
Ceiling-C	ceiling value
CMR	Carcinogenic, Mutagenic or toxic for Reproduction
DGR	Dangerous Goods Regulations (see IATA/DGR)
DMEL	Derived Minimal Effect Level
DNEL	Derived No-Effect Level
EC50	Effective Concentration 50 %. The EC50 corresponds to the concentration of a tested substance causing 50 % changes in response (e.g. on growth) during a specified time interval
EINECS	European Inventory of Existing Commercial Chemical Substances
ELINCS	European List of Notified Chemical Substances
EmS	Emergency Schedule
ErC50	≡ EC50: in this method, that concentration of test substance which results in a 50 % reduction in either growth (EbC50) or growth rate (ErC50) relative to the control
GHS	"Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations
IATA	International Air Transport Association
IATA/DGR	Dangerous Goods Regulations (DGR) for the air transport (IATA)
ICAO	International Civil Aviation Organization
IMDG	International Maritime Dangerous Goods Code
index No	the Index number is the identification code given to the substance in Part 3 of Annex VI to Regulation (EC) No 1272/2008
LC50	Lethal Concentration 50%: the LC50 corresponds to the concentration of a tested substance causing 50 % lethality during a specified time interval

## Ethylenediamine $\geq 99,5\%$ , for synthesis

article number: **4218**

Abbr.	Descriptions of used abbreviations
LD50	Lethal Dose 50 %: the LD50 corresponds to the dose of a tested substance causing 50 % lethality during a specified time interval
MARPOL	International Convention for the Prevention of Pollution from Ships (abbr. of "Marine Pollutant")
NLP	No-Longer Polymer
NOEC	No Observed Effect Concentration
PBT	Persistent, Bioaccumulative and Toxic
PNEC	Predicted No-Effect Concentration
ppm	parts per million
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
RID	Règlement concernant le transport International ferroviaire des marchandises Dangereuses (Regulations concerning the International carriage of Dangerous goods by Rail)
STEL	short-term exposure limit
TWA	time-weighted average
vPvB	very Persistent and very Bioaccumulative
WES	Safe Work Australia: Workplace exposure standards for airborne conatminants

### Key literature references and sources for data

- UN Recommendations on the Transport of Dangerous Good
- Dangerous Goods Regulations (DGR) for the air transport (IATA)
- International Maritime Dangerous Goods Code (IMDG)

### List of relevant phrases (code and full text as stated in chapter 2 and 3)

Code	Text
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

### Disclaimer

The above information describes exclusively the safety requirements of the product and is based on our present-day knowledge. The information is intended to give you advice about the safe handling of the product named in this safety data sheet, for storage, processing, transport and disposal. The information cannot be transferred to other products. In the case of mixing the product with other products or in the case of processing, the information on this safety data sheet is not necessarily valid for the new made-up material.