



SAFETY DATA SHEET
According to Regulation (EC) No. 1907/2006

Piperazine Anhydrous

1. IDENTIFICATION OF THE SUBSTANCE OR PREPARATION AND THE COMPANY/UNDERTAKING

Product label name Piperazine	
Supplier DELAMINE B.V. Barchman Wuytierslaan 10 3818 LH Amersfoort PO Box 473 3800 AL Amersfoort The Netherlands Tel.: +31-334676897	
E-mail address of person responsible for safety data sheet SDS.Delamine@delamine.com	
Emergency telephone AkzoNobel Chemicals-Deventer-NLT +31 570 679211 F +31 570 679801	
Intended use Chemical intermediate	
Date of last issue / Revision number 2010/05/27 / 4.13	

2. HAZARDS IDENTIFICATION

Causes burns. May cause sensitization by inhalation and skin contact. Harmful to aquatic organisms. May cause long-term adverse effects in the aquatic environment. When dust is inhaled the substance may appear in the stomach where possible carcinogenic nitrosamines may be formed.
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3. COMPOSITION/INFORMATION ON INGREDIENTS

This product is to be considered as a substance in conformance to EC directives.			
Information on hazardous ingredients			
Chemical description Piperazine			
Composition / information on ingredients			
Number	% w/w	CAS-number	Chemical name
1	approx. 100	000110-85-0	Piperazine

	Index-No.	EC-number	Symbol(s) (EU classification)	Risk-phrase(s)
1	612-057-00-4	203-808-3	C	R34 R42/43 R52/53

4. FIRST AID MEASURES

Symptoms and effects Corrosive to eyes, skin and upper respiratory tract.
First aid
General In all cases of doubt, or when symptoms persist, seek medical attention.



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Inhalation

Provide fresh air, rest, half upright position. Seek medical advice after significant exposure.

Skin

Remove immediately all contaminated clothing. Wash off with soap and water. Seek medical advice if irritation develops. Launder contaminated clothes with plenty of water before reuse. Destroy contaminated shoes if made of leather.

Eye

Rinse immediately and as long as possible with plenty of water (at least 15 minutes). Eyelids should be held away from the eyeball to ensure thorough rinsing. DO NOT remove contact lenses.

Ingestion

Only when conscious, rinse mouth, give plenty of water to drink. DO NOT induce vomiting. Seek medical advice.

Advice to physician

No specific antidote known. Symptomatic treatment is advised. If burn is present treat as any thermal burn after decontamination. If necessary evacuation of the stomach contents should be undertaken by means carrying the least likelihood of aspiration (e.g. gastric lavage in combination with endotracheal intubation).

5. FIRE-FIGHTING MEASURES

Extinguishing media

water, spray, foam, sand, Carbon dioxide, dry powder.

Unsuitable extinguishing media

halones.

Hazardous decomposition / combustion products

Nitrous gases may be produced.

Protective equipment

Wear self contained breathing apparatus. Wear a standard aluminised firefighting suit.

Other information

Cool closed containers with water. Do not direct a solid stream of water or foam into the burning material; this may cause spattering and spread the fire. Water used to extinguish a fire should not be allowed to enter the drainage system or water courses.

Fire and explosion hazard

Toxic fumes.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

For personal protection see Section 8.

Environmental precautions

Treat using the best available techniques before discharge into drains or the aquatic environment.

Methods for cleaning up

Take up mechanically. Collect as much as possible in a clean container for (preferable) reuse or disposal. Flush remainder with water.

7. HANDLING AND STORAGE

Handling

Persons with a history of sensitization of the skin or the respiratory tract should not be employed in any process in which this product is used. Transfer and handle product only in closed system. When using do not eat, drink or smoke. Avoid contact with skin and eyes. Use only in well-ventilated areas. When workers are facing concentrations above 1 ppm v/v they must use appropriate certified respirators.

Fire and explosion prevention

Keep away from sources of ignition - No smoking.

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Storage requirements

Store in a dry well ventilated place away from sources of heat and direct sunlight. Store in closed containers preferably under nitrogen.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls

Take precautionary measures against static discharges. Use only in closed system. Do not use copper, nickel and cobalt containing alloys in process equipment. Ensure good ventilation and local exhaustion of the working area.

Personal protection

Respiratory

When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. (Organic vapour or ammonia/amines approved cartridge) Use self-contained or supplied-air respiratory equipment with filter K. When dust is present the combined cartridge K/P should be used.

Hand

Protective neoprene gloves.

Eye

Safety goggles recommended.

Skin and body

Protective neoprene boots and protective clothing.

Other information

Launder contaminated clothes with plenty of water before reuse. Contaminated leather items (shoes, belts, watch bands etc.) should be removed and destroyed.

Piperazine		
Short Term Exposure Limit (STEL)	0.3 mg/m ³	
Time Weighted Average (TWA)	0.1 mg/m ³	

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

flakes

Colour

colourless

Odour

ammonia like

Boiling point/range

148 °C

Melting point/range

110 °C

Flash point

66 °C (Pensky-Martens, closed cup)

Flammability

not determined

Explosive properties

not determined

Oxidising properties

not applicable

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Vapour pressure 0.28 kPa (20 °C)
Density 1100 kg/m ³ (20 °C)
Bulk density 400 kg/m ³ (20 °C)
Solubility in water Completely miscible
Solubility in other solvents not available
pH value 12 (100 g/l water, 20 °C)
Partition coefficient n-octanol/water Log Pow: < 0
Relative vapour density (air=1) 3
Viscosity not applicable
Autoignition temperature 340 °C
Explosion limits LEL: 4 Vol % UEL: 14 Vol %

10. STABILITY AND REACTIVITY

Conditions to avoid
Formation of an aerosol.
Stability Stable under recommended storage and handling conditions (see section 7).
Incompatibles acids, chlorinated hydrocarbons, oxidising agents, copper and copper alloys, nickel, cobalt.
Hazardous decomposition products Nitrous gases may be produced.

11. TOXICOLOGICAL INFORMATION

Piperazine
Acute toxicity
Oral LD50 rat: 1900-4500 mg/kg
Dermal LD50 rabbit: 4000 mg/kg
Inhalation LC50 5.4 mg/l (2 hours)
Irritation
Skin Highly irritating

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Eye irritating
Respiratory irritating
Sensitization Causing skin sensitization. Causing sensitization of the respiratory tract.
Genotoxicity Not mutagenic.
Chronic toxicity / Carcinogenicity Suspected of damaging fertility. Suspected of damaging the unborn child.
Other toxicological information Not teratogenic. When dust is inhaled the substance may appear in the stomach where possible carcinogenic nitrosamines may be formed.

12. ECOLOGICAL INFORMATION

Piperazine
Ecotoxicity
Ecotoxicological information The environmental classification for this substance will be canceled subsequent to entry into force of the 30th ATP.
fish Acute toxicity, 96h-LC50: > 1000 mg/l (Poecilia reticulata)
daphnia Acute toxicity, 48h-EC50: 26 mg/l (Daphnia magna)
algae Acute toxicity, 72h-IC50: > 1000 mg/l (Selenastrum capricornutum)
bacteria Acute toxicity, EC50: > 1000 mg/l (Pseudomonas putida) Acute toxicity, EC50: 633 mg/l (Nitrifying bacteria)
Fate
Degradation Biotic Inherently biodegradable (SCAS test)
Other information Activated sludge respiration inhibition test EC50 : > 1600 mg/l Daphnia magna reproduction test NOEL 12.5 mg/l (Akzo Nobel E-file).

13. DISPOSAL CONSIDERATIONS

Product Incineration is recommended.
Contaminated packaging Containers which cannot be cleaned should be disposed of in the same manner as the substance.
Other information For further advice contact manufacturer.

14. TRANSPORT INFORMATION



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<i>Land transport</i>
Class 8
Classification Code C8
RID class 8
Packing group III
Hazard Identification No. 80
Substance Identification No. 2579
UN number 2579
Proper Shipping Name PIPERAZINE, solid
Other information Transport label(s): 8 ADR Tunnel code: E

<i>Sea transport (IMO / IMDG-code)</i>
Class 8
Packing group III
UN number 2579
EMS F-A, S-B
Marine pollutant no
Proper Shipping Name Piperazine, solid
Other information Transport label(s): 8

<i>Air transport (ICAO-TI / IATA-DGR)</i>
UN number 2579
Class 8
Packing group III
Proper Shipping Name Piperazine, solid

15. REGULATORY INFORMATION


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Product label name Piperazine
Labelling according to EC directives
EC-number 2038083
Classification based on Annex-VI

R(isk) phrase(s) (EU classification)	
Code	Description
R34	Causes burns
R42/43	May cause sensitization by inhalation and skin contact
R52/53	Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment

S(afety) phrase(s) (EU classification)	
Code	Description
S22	Do not breathe dust
S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
S36/37/39	Wear suitable protective clothing, gloves and eye/face protection
S45	In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible)
S61	Avoid release to the environment. Refer to special instructions/Safety data sheets

Symbol(s) (EU classification)	
	
CORROSIVE	

Other information TSCA Inventory (USA): yes DSL (Canada): yes
German Water Hazard Class (WGK) 1

16. OTHER INFORMATION

R-phrase information



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Chemical name	R(isk) phrase(s) (EU classification)	
Piperazine	R34 R42/43 R52/53	Causes burns May cause sensitization by inhalation and skin contact Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment

History
Date of printing/ pdf file generated 2010/07/23
Revision 4.13
Composed by M. Gyimesi J. Bos
Changes were made in section Ch14
<small>This information only concerns the above mentioned product and does not need to be valid if used with other product(s) or in any process. The information is to our best present knowledge correct and complete and is given in good faith but without warranty. It remains the user's own responsibility to make sure that the information is appropriate and complete for his special use of this product.</small>