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
T +31570679211
F +31570679801

AkzoNobel Chemicals-Deventer-NL

Intended use
Chemical intermediate

Date of last issue / Revision number
2010/02/10 / 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 carcenogenic nitrosamines may be formed.

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) (wettelijke grenswaarde)	0.3 mg/m³	
Time Weighted Average (TWA) (wettelijke grenswaarde)	0.1 mg/m³	

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance
flakes

Colour
colourless

Odour
ammonia like

Boiling point/range
148 ℃

Melting point/range
110 ℃

Flash point
66 ℃ (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 ℃)
Density 1100 kg/m³ (20 ℃)
Bulk density 400 kg/m³ (20 ℃)
Solubility in water Completely miscible
Solubility in other solvents not available
pH value 12 (100 g/l water, 20 ℃)
Partition coefficient n-octanol/water Log Pow: < 0
Relative vapour density (air=1) 3
Viscosity not applicable
Autoignition temperature 340 ℃
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 carcenogenic 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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Land transport
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

Sea transport (IMO / IMDG-code)
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

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

15. REGULATORY INFORMATION

Piperazine Anhydrous

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

Piperazine Anhydrous

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
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