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

Pentaethylenehexamine, PEHA

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

Product label name
Pentaethylenehexamine

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
+ 31 570679211 (Fax. + 31 570679801)
Akzo Nobel Chemicals-Deventer-NL

Intended use
Chemical intermediate

Date of last issue / Revision #
2007/05/31 / 2.09

2. HAZARDS IDENTIFICATION

Causes burns.
May be very toxic by inhalation of aerosols.
May cause sensitization by inhalation and skin contact.
Very toxic to aquatic organisms.
May cause long-term adverse effects in the aquatic environment.

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
Pentaethylenehexamine

Composition / information on ingredients

Number	% w/w	CAS-number	Chemical name
1	approx. 100	004067-16-7	Pentaethylenehexamine

	Annex-1 number	EC-number	Symbol(s)	Risk-phrase(s)
1	612-064-00-2	223-775-9	C N	R34 R43 R50/53

4. FIRST AID MEASURES

Symptoms and effects
Corrosive to eyes, skin and upper respiratory tract.
May be very toxic by inhalation of aerosols. (Do not delay treatment of exposed individuals, death may result.)

First aid

General
In all cases of doubt, or when symptoms persist, seek medical attention.

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

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Skin
Remove immediately all contaminated clothing. Wash off immediately with plenty of soap and water. Take all contaminated clothing off immediately. 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. Always seek medical attention.

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
Absorb with sand, sweep up and put into a container for 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.

Storage requirements
Store in a dry well ventilated place away from sources of heat and direct sunlight. Store in closed containers preferably under nitrogen.
Avoid contact with atmospheric moisture.

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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 1 ppm v/v they must use appropriate certified respirators. Use self-contained or supplied-air respiratory equipment with filter K. When aerosols are present the combined cartridge K/P should be used.

Hand
Protective neoprene gloves. Use self-contained or supplied-air respiratory equipment with filter K. When aerosols are present the combined cartridge K/P should be used.

Eye
Wear tightly fitting safety goggles.

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.

In this country no exposure limit has been established

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance
liquid

Colour
yellow

Odour
ammonia like

Boiling point/range
> 350 ℃

Melting point/range
-26 ℃

Flash point
174 ℃ (Pensky-Martens, closed cup)

Flammability
not determined

Explosive properties
not determined

Oxidizing properties
not applicable

Vapour pressure
< 0.001 kPa (20 ℃)

Density
1001 kg/m³ (20 ℃)

Bulk density
not applicable

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Solubility in water Completely miscible
Solubility in other solvents not available
pH value approx. 12 (100 g/l water, 20 ℃)
Partition coefficient n-octanol/water Log Pow: < 0
Relative vapour density (air=1) not determined
Viscosity 200 mPa.s (20 ℃)
Autoignition temperature > 300 ℃
Explosion limits not determined

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, oxidizing agents, copper and copper alloys, nickel, cobalt.
Decomposition Nitrous gases may be produced.

11. TOXICOLOGICAL INFORMATION

Pentaethylenehexamine
Acute toxicity
Oral LD50 rat: 1600 mg/kg.
Inhalation LC50 May be very toxic by inhalation of aerosols.
Irritation
Skin Corrosive.
Eye Corrosive.
Respiratory Highly irritating.
Genotoxicity Positive (Ames test, in presence of S9 mix only)

12. ECOLOGICAL INFORMATION

Pentaethylenehexamine.
Ecotoxicity

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fish Acute toxicity, 96h-LC50 : 180 mg/l (Poecilia reticulata).
daphnia Acute toxicity, 48h-EC50: 18 mg/l (Daphnia magna).
algae Acute toxicity: 72h-IC50: 0.7 mg/l (Selenastrum capricornutum).
bacteria Acute toxicity, EC 50: 18 mg/l (Pseudomonas putida). Acute toxicity, EC 50: 164 mg/l (Nitrifying bacteria).
Fate
Degradation Biotic Not readily biodegradable (Closed bottle test).
Other information Activated sludge respiration inhibition test EC50: >1600 mg/l.

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

Land transport
Class 8
Classification Code C7
RID class 8
Packing group III
Hazard Identification No. 80
Substance Identification No. 2735
TREM-Card or ERG number CEFIC TEC(R)- 80GC7-II+III
UN number 2735
Proper Shipping Name POLYAMINES, LIQUID, CORROSIVE, N.O.S. "Pentaethylenehexamine" (Pentaethylenehexamine).

Sea transport (IMDG-code/ IMO)
Class 8

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Packing group III
UN number 2735
EMS F-A, S-B
Marine pollutant no
Proper Shipping Name Polyamines, liquid, corrosive, n.o.s. "Pentaethylenehexamine" (Pentaethylenehexamine).

Air transport (ICAO-TI/ IATA-DGR)
UN number 2735
Class 8
Packing group III
Proper Shipping Name Polyamines, liquid, corrosive, n.o.s. "Pentaethylenehexamine" (Pentaethylenehexamine).

15. REGULATORY INFORMATION

Product label name Pentaethylenehexamine
Labelling according to EC directives
EC-number 2237759
Classification based on Annex-1

R(isk) phrase(s)	
Code	**Description**
R34	Causes burns
R43	May cause sensitization by skin contact
R50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment

S(afety) phrase(s)	
Code	**Description**
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)

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S60	This material and its container must be disposed of as hazardous waste
S61	Avoid release to the environment. Refer to special instructions/Safety data sheets

Symbol(s)	
	
CORROSIVE	DANGEROUS FOR THE ENVIRONMENT

Other information
TSCA Inventory (USA): yes
DSL (Canada): yes
Substance and/or product listed in Directive 96/82/EC.

German Water Hazard Class (WGK)
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16. OTHER INFORMATION

R-phrase information		
Chemical name	R(isk) phrase(s)	
Pentaethylenehexamine	R34 R43 R50/53	Causes burns May cause sensitization by skin contact Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment

History

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Composed by
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Changes were made in section
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15: WGK