

# MATERIAL SAFETY DATA SHEET

Product name : **PROPYLENE IMINE**

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## 1 IDENTIFICATION OF THE SUBSTANCE

Commercial tradename : **PROPYLENE IMINE**

Application : Intermediate for a broad spectrum of industry, adhesives, coatings, paper treatments, textile dyeing and printing, petroleum refining, fiber modification, rocket propellant fuel and in biological products.

Manufacturer : **MENADIONA, S.L.**  
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## 2 CHEMICAL CHARACTERISATION

Chemical name : 2-methylaziridine

Synonym : 2-methylethylenimine  
2-methylazacyclopropane

CAS number : [75-55-8]

EC number (EINECS) : 200-878-7

NIOSH code : CM 8050000

## 3 HAZARDS IDENTIFICATION

Flammable and toxic product.

Development of toxic gases (oxides of nitrogen, cyanide compounds) in case of fire.

Dangerous: At elevated temperatures, Propylene Imine may polymerize with evolution of heat and the possibility of a violent rupture of the container.

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## 4 FIRST AID MEASURES

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Inhalation : May cause irritation of respiratory tract, burns, tearing, vomiting, diarrhea, difficulty breathing, headache, drowsiness and symptoms of drunkenness.

Remove to fresh air. Get medical attention immediately.

Eye contact : Cause irritation and burns.

Wash eyes immediately with large amounts of water, occasionally lifting upper and lower lids, until no evidence of chemicals remains. Continue irrigating with normal saline until ready to transport to hospital. Cover with sterile bandages. Get medical attention immediately.

Skin contact : May cause burns, blisters and death.

Immediately flush the skin with large amounts of running water, and wash the affected area thoroughly with plenty of soap and water for at least 30 minutes.

Remove contaminated clothing and wash before re-use.  
Get medical attention, if needed.

Ingestion : May cause burns, vomiting, dizziness, blindness, kidney damage, and death.

Contact local poison control centre or physician immediately. Never make an unconscious person vomit or drink fluids. When vomiting occurs, keep head lower than hips to help prevent aspiration. If person is unconscious, turn head to side. Get medical attention immediately.

Note to physician : For ingestion, consider gastric lavage.

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## 5 FIRE FIGHTING MEASURES

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Extinguishing media : Powder, alcohol-resistant, foam, water spray, carbon dioxide.

Prevent disposal of extinguishing water in sewage system or surface water.

Prevent inhalation of decomposition gases (toxic oxides of nitrogen, cyanide compounds).

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## 6 ACCIDENTAL RELEASE MEASURES

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- Personal precautions : Use during all cleaning operations suitable protection equipment: synthetic rubber, gloves, chemical workers goggles and gas mask (organic vapour or ammonia type).
- Methods for cleaning : Any accidental spillage should be flushed immediately with copious amounts of water, and neutralised with acetic acid.
- Disposal : Collect as much of neutralised spilled material as possible for treatment or disposal following all local, state and federal regulations.

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## 7 HANDLING AND STORAGE

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### HANDLING

- Personal measures : Avoid ingestion, inhalation of vapours and skin contact. Operator should wear a gas mask (organic vapour, canister type) when working with or handling Propylene Imine.
- Technical measures : Make use of local exhaust in handling.

### STORAGE

- Measures : Propylene Imine drums, cylinders and IBC should be stored in an isolated area away from heat, sparks, flames, acid and acid vapours (and other oxidizing agents) and flammable materials.
- Propylene Imine should be stored in a cool area. The fine temperature for storage is 60°F or lower.

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## 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

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- Technical measures : Make use of local exhaust during handling.
- Respiratory protection : Gas mask for organic vapours or ammonia.
- Hand protection : Synthetic rubber gloves.
- Eye protection : Goggles or full-face mask.

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## 9 PHYSICAL AND CHEMICAL PROPERTIES

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Appearance : Fuming and colourless liquid with ammonialike odour

Molecular weight : 57.10

Molecular formula :  $C_3H_7N$

Boiling point : 66°C

Freezing point : -65°C

Vapor pressure : 140 mm Hg at 25°C

Vapor density (air=1) : 2.0

Specific Gravity : 0,802 at 25°C (liquid).

Viscosity : 0.418 cP at 25°C

Solubility : Soluble in water

Liquid surface tension : 25 dynes/cm at 20°C

Latent Heat of vaporization : 139 cal/g.

Head of Combustion : -8600 cal/g.

Flash Point : -5°C

Ignition temperature : Data not available

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## 10 STABILITY AND REACTIVITY

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All Propylene Imine is stored and shipped in the presence of anhydrous sodium hydroxide and this acts both as a dehydrating agent and neutralising agent in the event the material becomes accidentally exposed to an acid atmosphere.

Propylene Imine stored and shipped this way, if the drums, cylinders and IBC are kept tightly closed and away from high temperatures (80°F or higher) has an indefinite shelf life.

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## 11 TOXICOLOGICAL INFORMATION

### Oral Toxicity:

The LD<sub>50</sub> of Propylene imine on oral ingestion of a single dose by rats is 19 mg/Kg. This relatively low LD<sub>50</sub> indicates that Propylene Imine is a poisonous material and extreme care should be used to avoid ingestion.

### Toxicity by Absorption:

Propylene Imine is also toxic by skin absorption. The LD<sub>50</sub> for penetration of guinea pigs by poultices applied to the skin has been reported as 43 mg/Kg. The comparable figure for ethylene imine is 14 mg/Kg. Both are classified as having comparable toxicity by skin penetration to crotonaldehyde. While no reports on skin sensitisation by Propylene Imine have been found, this is certainly possible since Smyth and co-workers reports two cases of skin sensitisation by ethylene imine.

### TOXICITY DATA (\*):

Administration into eye (Rabbits)	: 250 ug produce severe irritation effects.
Mutation in micro-organism (Salmonella typhimurium)	: 5 ug/plate.
Microsomal mutagenicity assay (Salmonella typhimurium)	: 150 ug/plate.
DNA repair (Escherichia coli)	: 2 ug/plate.
Gene conversion and mitotic recombination (Saccharomyces cerevisiae)	: 100 ppm
Host mediated assay (mouse) (Salmonella typhimurium)	: 355 mg/Kg
DNA damage (hamster-lung)	: 300 umol/L/1H
Oral rat TDLo	: 1120 mg/Kg
Oral rat LD <sub>50</sub>	: 19 mg/Kg
Inhalation rat LCLo	: 500 ppm/4H
Inhalation guinea pig LCLo	: 500 ppm/1H
Administration onto skin	: 43 mg/Kg

CARCINOGENIC DETERMINATION: Animal Positive IARC \*\* 9, 61, 75.

(\*) Dangerous Properties of Industrial Materials. N.IRVING SAX Sixth Edition.

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## 12 ECOLOGICAL INFORMATION

Since Propylene Imine is a toxic material it may disturb the functioning of biological waste water treatment plants.

Therefore care should be taken in case of fire in considerable quantities of Propylene Imine, to prevent disposal of extinguishing water in the sewage lines.

## 13 DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable regulations.

Any accidental spillage should be flushed immediately with copious amounts of water, and neutralised with acetic acid.

Collect as much of neutralised spilled material as possible for treatment or disposal following all local, state and federal regulations.

## 14 TRANSPORT INFORMATION

Land transport **ADR/RID** Substance name : Propylene imine stabilized  
UN number : UN1921  
ADR/RID Class : 3  
Packing group : I  
Labels : 3; 6.1  
Hazard id number : 336

Air transport **IATA/ICAO** Correct technical name : Propylene imine stabilized  
UN/ID number : UN1921  
IATA/ICAO Class : 3  
Packaging group : I  
Label : Flammable and toxic liquid  
Secondary Hazard : 6.1

Maritime transport **IMDG** Correct technical name : Propyleneimine, inhibited  
UN/ID number : UN1921  
IMDG Class : 3  
Packaging group : I  
Subsidiary risk label : Poison  
FEm. : 3-02  
Marine pollutant : N

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## 15 REGULATORY INFORMATION

Classification : F Highly flammable T+ Very Toxic



Risk Phrases : R45 May cause cancer.  
R11 Highly flammable.  
R26/27/28 Very toxic by inhalation, in contact with the skin and if swallowed.  
R41 Risk of serious damage to eyes.  
R51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases : S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible)  
S53 Avoid exposure – obtain special instructions before use.

## 16 OTHER INFORMATION

The information contained herein is applicable solely to the chemical substance when used in manufacturing and does not relate to other use of the substance described.

Its use is intended for persons having technical skill and their own discretion and risk.

The information has been developed from sources considered reliable, but has not been independently verified. Therefore, the manufacturer cannot guarantee the accuracy of the information from these sources nor should the statements contained herein be considered an official expression.

**No representation or warranty, expressed or implied, including the warranties of merchantable and fitness for a particular use is made with respect to the information contained herein.**

Indicate variations regards to previous version

Version: 007/2005/E replaces edition of 08/12/2005 version 006/2005/E