

TY-0794-00992



FYI-94-000992  
INIT 07/14/94

UNION CARBIDE CORPORATION  
INDUSTRIAL CHEMICALS DIVISION

FYI-0794-00992  
39 OLD RIDGEBURY ROAD, DANBURY, CT 06817-0001



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July 17, 1987

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Ms. Roberta Wedge  
Staff Scientist  
Dynamac Corporation  
The Dynamac Building  
11140 Rockville Pike  
Rockville, Maryland 20852

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Dear Ms. Wedge:

Based on our telephone conversation of today, I understand that Dynamac is requesting tetraethylenepentamine information as originally indicated verbally to Dr. D. L. Heywood rather than pentaethylene hexamine as indicated in your March 31, 1987 letter.

Accordingly, we have assembled the following enclosed data:

- Ethyleneamine Product Booklet
- Tetraethylenepentamine MSDS
- Tetraethylenepentamine Toxicity Data
  - Range Finding Toxicity and 7 Day Dietary Inclusion Studies (April 5, 1979)
  - In Vitro Mutagenesis Studies: 3 Test Battery (October 31, 1980)
  - Department of Transportation (D.O.T.) Skin Irritancy Test (July 14, 1982)
  - Dermal Carcinogenesis Study in Male C3H/HeJ Mice (January 12, 1983)

Please contact Union Carbide if additional information is needed.

Very truly yours,

G. P. Merrill  
Product Marketing Manager

/dmg  
Enclosures

10/18/94

EFFECTIVE DATE: October, 1985

## DO NOT DUPLICATE THIS FORM. REQUEST ORIGINAL.

Union Carbide Corporation urges the customer receiving this Material Safety Data Sheet to study it carefully to become aware of hazards. If any of the product involved. In the interest of safety you should (1) notify your employees, agents, and contractors of the information on this sheet, (2) furnish a copy to each of your customers for the product, and (3) request your customers to inform their employees and customers as well.

## I. IDENTIFICATION

PRODUCT NAME:	TETRAETHYLENEPENTAMINE - HIGH PURITY		
CHEMICAL NAME:	Tetraethylenepentamine	CHEMICAL FAMILY:	Ethyleneamines
FORMULA:	~C <sub>8</sub> H <sub>23</sub> N <sub>5</sub> (linear, branched, congeners)	MOLECULAR WEIGHT:	189.31
(linear)			
SYNONYMS:	TEPA-HP		
CAS #	112-57-2	CAS NAME	1,2-Ethanediamine, N-(2-aminoethyl)-N'-[2-[(2-aminoethyl)amino]ethyl]-

## II. PHYSICAL DATA

BOILING POINT, 760 mm Hg	Extrapolated 323°C (613°F)	POUR POINT	-37°C (-35°F)
SPECIFIC GRAVITY (H <sub>2</sub> O = 1)	0.9952 at 20/20°C	VAPOR PRESSURE at 20°C.	<0.01 mm Hg
VAPOR DENSITY (air = 1)	~6	SOLUBILITY IN WATER, % by wt. at 20°C	100
APPEARANCE AND ODOR	Pale yellow liquid; amine odor.	EVAPORATION RATE (Butyl Acetate = 1)	<0.001

## III. INGREDIENTS

MATERIAL	%	TLV	HAZARD
Tetraethylenepentamine	~90	None established	See Section V
Triethylenetetramine	~7	None established	See Section V
Pentaethylenehexamine	~3	None established	See Section V

## IV. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	320°F, Pensky-Martens closed cup ASTM D 93 335°F, Cleveland open cup ASTM D 92		
FLAMMABLE LIMITS IN AIR, % by volume	LOWER	0.8	UPPER 4.6
EXTINGUISHING MEDIA	Apply alcohol-type or all-purpose-type foams by manufacturers' recommended techniques for large fires. Use CO <sub>2</sub> or dry chemical media for small fires.		
SPECIAL FIRE FIGHTING PROCEDURES	Do not spray pool fires directly; a solid stream of water directed into hot, burning liquid can cause splattering. Use self-contained breathing apparatus and protective clothing; oxides of nitrogen will be evolved.		

EMERGENCY PHONE NUMBER • 1-800-UCC-HELP • This number is available days, nights, weekends, and holidays.

IV. FIRE AND EXPLOSION HAZARD DATA (Continued)

UNUSUAL FIRE AND EXPLOSION HAZARDS

None

V. HEALTH HAZARD DATA [ADVERSE HEALTH EFFECTS WHICH MAY OCCUR FROM OVEREXPOSURE.]

TLV AND SOURCE:

None established by ACGIH or OSHA.

EFFECTS OF AN ACUTE OVEREXPOSURE

SWALLOWING	Moderately toxic. May cause burns of mouth and throat, abdominal pain, nausea, vomiting, and diarrhea.
SKIN ABSORPTION	Prolonged or repeated exposure may result in the absorption of harmful amounts of material.
INHALATION	Vapors are irritating and may cause sensitization of the respiratory tract, resulting in a potential asthmatic response.
SKIN CONTACT	Causes chemical burns and may result in the development of an allergic skin reaction.
EYE CONTACT	Causes moderate corneal injury.

EFFECTS OF REPEATED OVEREXPOSURE

No evidence of adverse effects from available information.

OTHER EFFECTS OF OVEREXPOSURE

Exposure may result in sensitization of the skin and/or the respiratory tract. Because of its irritating properties, this material may aggravate an existing dermatitis. Breathing of vapor and/or mists may aggravate asthma and inflammatory or fibrotic pulmonary disease.

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION

This material has exhibited evidence for weak mutagenic activity in standard in vitro test systems. The material did not exhibit carcinogenic potential in life-time mouse skin painting studies. The relevance of mutagenic activity of this material to potential health hazards in man is not known at the present time.

(continued)

## V. HEALTH HAZARD DATA (Continued)

## EMERGENCY AND FIRST AID PROCEDURES:

SWALLOWING	Do not induce vomiting. Give large quantities of water to dilute material, call a physician.
SKIN	Remove contaminated clothing and flush skin with plenty of water. Call a physician.
INHALATION	Remove to fresh air. If breathing is difficult, oxygen may be given, call a physician.
EYES	Immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention, preferably an ophthalmologist, promptly.

## NOTES TO PHYSICIAN

There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition.

## VI. REACTIVITY DATA

STABILITY		CONDITIONS TO AVOID	None
UNSTABLE	STABLE		
--	X		
INCOMPATIBILITY (materials to avoid)		Avoid contamination with mineral or organic acids, oxidizing materials, aldehydes, ketones and organic halides.	
HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS		Burning can produce carbon monoxide and/or carbon dioxide and oxides of nitrogen.	
HAZARDOUS POLYMERIZATION		CONDITIONS TO AVOID	None
May Occur	Will Not Occur		
--	X		

## VII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED	Wear suitable protective equipment; avoid contact with liquid and vapors! Collect for disposal; avoid discharge to sewers and waterways; see Section IX.
WASTE DISPOSAL METHOD	Incinerate in a furnace where permitted under appropriate Federal, State, and local regulations. Also, see Section IX.

(continued)

VIII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type)	Self-contained breathing apparatus in high vapor concentrations.		
VENTILATION	This product should be confined within covered equipment, in which case general (mechanical) room ventilation should be satisfactory. Special, local ventilation is needed at points where vapors can be expected to escape to the workplace air.		
PROTECTIVE GLOVES	Butyl	EYE PROTECTION	Monogoggles
OTHER PROTECTIVE EQUIPMENT	Eye bath, safety shower and chemical apron		

IX. SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

- Do not get in eyes, on skin, on clothing.
- Avoid breathing vapor.
- Keep container closed.
- Use with adequate ventilation.
- Wash thoroughly after handling
- Do not take internally.

FOR INDUSTRY USE ONLY

OTHER PRECAUTIONS

**SPILLS** - This product is resistant to biodegradation in a biological wastewater treatment plant. A large spill could be toxic to the biomass in a treatment plant or could be toxic to fish. Therefore, avoid discharge to sewers or to natural waters.

**DISPOSAL** - It may be feasible to neutralize waste, aqueous tetraethylenepentamine (with dilute aqueous acid, such as hydrochloric acid) and dispose of the resulting neutral salts in an approved chemical landfill. However, neutralization must be done with care, under controlled conditions; the neutralization reaction is exothermic.

The opinions expressed herein are those of qualified experts within Union Carbide Corporation. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and of these opinions and the conditions of use of the product are not within the control of Union Carbide Corporation, it is the user's obligation to determine the conditions of safe use of the product.