



Material Safety Data Sheet

HAZARD WARNINGS	RISK PHRASES	PROTECTIVE CLOTHING
	Combustible material; avoid heat and sources of ignition. Corrosive to eyes and skin on contact. Harmful compound, minimize exposure. Hygroscopic -- keep container tightly sealed. Absorbs water and carbon dioxide from air. Store under nitrogen.	

Section I. Chemical Product and Company Identification

Chemical Name	1,6-Diaminohexane		
Catalog Number	D0095	Supplier	TCl America 9211 N. Harborgate St. Portland OR 1-800-423-8616
Synonym	Hexamethylenediamine		
Chemical Formula	NH ₂ (CH ₂) ₆ NH ₂		
CAS Number	124-09-4	In case of Emergency Call	Chemtrec® (800) 424-9300 (U.S.) (703) 527-3887 (International)

Section II. Composition and Information on Ingredients

Chemical Name	CAS Number	Percent (%)	TLV/PEL	Toxicology Data
1,6-Diaminohexane	124-09-4	Min. 99.0 (GC,T)	Not available.	Rat LD ₅₀ (oral) 750 mg/kg Mouse LD ₅₀ (intravenous) 180 mg/kg Rabbit LD ₅₀ (dermal) 1110 mg/kg

Section III. Hazards Identification

Acute Health Effects	Corrosive to skin, eyes, and respiratory system. Liquid or spray mist may produce tissue damage, particularly in mucous membranes of the eyes, mouth and respiratory tract. Skin contact may produce burns. Eye contact can result in corneal damage or blindness. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Corrosive materials may cause serious injury if ingested. Harmful if ingested or inhaled. Minimize exposure to this material. Severe overexposure can result in injury or death. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.
Chronic Health Effects	CARCINOGENIC EFFECTS : Not available. MUTAGENIC EFFECTS : Not available. TERATOGENIC EFFECTS : Not available. DEVELOPMENTAL TOXICITY Reproductive: rat (oral) 1840mg/kg duration: female 6-15 days of pregnancy. Specific developmental abnormalities- Urogenital system. rat (oral) 3000mg/kg duration: female 6-15 days of pregnancy. Effects on embryo of fetus- Fetotoxicity. Specific developmental abnormalities- Napatobiliary system. Repeated exposure of the eyes to a low level of dust can produce eye irritation. Repeated skin exposure can produce local skin destruction, or dermatitis. Repeated inhalation of dust can produce varying degree of respiratory irritation or lung damage.


Section IV. First Aid Measures

Eye Contact	Check for and remove any contact lenses. IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. COLD water may be used. DO NOT use an eye ointment. Flush eyes with running water for a minimum of 15 minutes, occasionally lifting the upper and lower eyelids. Seek medical attention. Treat symptomatically and supportively.
Skin Contact	If the chemical gets spilled on a clothed portion of the body, remove the contaminated clothes as quickly as possible, protecting your own hands and body. Place the victim under a deluge shower. If the chemical touches the victim's exposed skin, such as the hands: Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. COLD water may be used. Seek medical attention. Treat symptomatically and supportively. Wash any contaminated clothing before reusing.
Inhalation	Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform artificial respiration. WARNING: It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention and, if possible, show the chemical label. Treat symptomatically and supportively.
Ingestion	DO NOT induce vomiting. Loosen tight clothing such as a collar, tie, belt, or waistband. If the victim is not breathing, administer artificial respiration. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Seek immediate medical attention and, if possible, show the chemical label. Treat symptomatically and supportively.

Section V. Fire and Explosion Data			
Flammability	Combustible.	Auto-Ignition	Not available.
Flash Points	85°C (185°F)	Flammable Limits	LOWER: 0.7% UPPER: 6.3%
Combustion Products	These products are toxic carbon oxides (CO, CO ₂), nitrogen oxides (NO, NO ₂).		
Fire Hazards	No specific information is available regarding the flammability of this compound in the presence of various materials.		
Explosion Hazards	Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. No additional information is available regarding the risks of explosion.		
Fire Fighting Media and Instructions	SMALL FIRE: Use DRY chemicals, CO ₂ , water spray or foam. LARGE FIRE: Use water spray, fog or foam. DO NOT use water jet.		

Section VI. Accidental Release Measures	
Spill Cleanup Instructions	Combustible material. Corrosive solid. Harmful solid. Hygroscopic material. Stop leak if without risk. DO NOT get water inside container. DO NOT touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all sources of ignition. Consult federal, state, and/or local authorities for assistance on disposal.

Section VII. Handling and Storage	
Handling and Storage Information	COMBUSTIBLE. CORROSIVE. HARMFUL. HYGROSCOPIC. ABORBS WATER AND CARBONDIOXIDE FROM AIR. STORE UNDR NITROGEN. Keep container dry. Keep away from heat and sources of ignition. Mechanical exhaust required. When not in use, tightly seal the container and store in a dry, cool place. Avoid excessive heat and light. DO NOT ingest. DO NOT breathe dust. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Treat symptomatically and supportively. Avoid contact with skin and eyes. Always store away from incompatible compounds such as oxidizing agents, acids, moisture.

Section VIII. Exposure Controls/Personal Protection	
Engineering Controls	Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.
Personal Protection	Splash goggles. Lab coat. Dust respirator. Boots. Gloves. A MSHA/NIOSH approved respirator must be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product. 
Exposure Limits	Not available.

Section IX. Physical and Chemical Properties			
Physical state @ 20°C	Colorless vitreous solid.	Solubility	Easily soluble in cold water, hot water. Slightly soluble in alcohol, benzene, and ether.
Specific Gravity	0.833 @ 60°C		
Molecular Weight	116.21	Partition Coefficient	Not available.
Boiling Point	204-205°C	Vapor Pressure	Not available.
Melting Point	42-45°C	Vapor Density	4.01
Refractive Index	Not available.	Volatility	Not available.
Critical Temperature	Not available.	Odor	Odor of piperdine.
Viscosity	Not available.	Taste	Not available.

Section X. Stability and Reactivity Data	
Stability	This material is stable if stored under proper conditions. (See Section VII for instructions)
Conditions of Instability	Avoid excessive heat and light. Absorbs CO ₂ from air. Absorbs moisture from the air. Hygroscopic; keep container tightly closed.
Incompatibilities	Reactive with oxidizing agents, acids, moisture, acid chlorides, and acid anhydrides.

Section XI. Toxicological Information

RTECS Number	MO1180000
Routes of Exposure	Eye contact. Ingestion. Inhalation. Skin contact.
Toxicity Data	Rat LD ₅₀ (oral) 750 mg/kg Mouse LD ₅₀ (intravenous) 180 mg/kg Rabbit LD ₅₀ (dermal) 1110 mg/kg
Chronic Toxic Effects	CARCINOGENIC EFFECTS : Not available. MUTAGENIC EFFECTS : Not available. TERATOGENIC EFFECTS : Not available. DEVELOPMENTAL TOXICITY Reproductive: rat (oral) 1840mg/kg duration: female 6-15 days of pregnancy. Specific developmental abnormalities- Urogenital system. rat (oral) 3000mg/kg duration: female 6-15 days of pregnancy. Effects on embryo of fetus- Fetotoxicity. Specific developmental abnormalities- Napatobiliary system. Repeated exposure of the eyes to a low level of dust can produce eye irritation. Repeated skin exposure can produce local skin destruction, or dermatitis. Repeated inhalation of dust can produce varying degree of respiratory irritation or lung damage.
Acute Toxic Effects	Corrosive to skin, eyes, and respiratory system. Liquid or spray mist may produce tissue damage, particularly in mucous membranes of the eyes, mouth and respiratory tract. Skin contact may produce burns. Eye contact can result in corneal damage or blindness. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Corrosive materials may cause serious injury if ingested. Harmful if ingested or inhaled. Minimize exposure to this material. Severe overexposure can result in injury or death. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.


Section XII. Ecological Information

Ecotoxicity	Not available.
Environmental Fate	Hexamethylene diamine's production and use as a chemical intermediate in the production of nylon-type polyimide resins will result in its release to the environment through a variety of waste streams. Based on an extrapolated vapor pressure of 0.12 mm Hg at 25 deg C, hexamethylene diamine is expected to exist solely as a vapor in the ambient atmosphere. Vapor-phase hexamethylene diamine is degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals with an estimated atmospheric half-life of about 6 hours. If released to soil, hexamethylene diamine is expected to have moderate mobility based on an estimated Koc value of 286. Volatilization from dry soil surfaces is not expected based upon the vapor pressure of this compound. Volatilization from moist soil surfaces is not expected based on an estimated Henry's Law constant of 3.2X10 ⁻⁹ atm-cu m/mol. Biodegradation in soils is expected to be an important environmental fate process for this compound. Standard BOD dilution techniques indicate that hexamethylene diamine biodegrades under aerobic conditions. In water, hexamethylene diamine is expected to adsorb to sediment or particulate matter based on the estimated Koc value of this compound. This compound is not expected to volatilize from water surfaces given its estimated Henry's Law constant. A measured pKa value of 11 indicates that hexamethylene diamine will not dissociate significantly at environmentally important pH values. Biodegradation is expected to occur slowly in aqueous environments. The potential for bioconcentration in aquatic organisms is low based on an estimated BCF value of 1. Occupational exposure may occur through inhalation and dermal contact with this compound at workplaces where hexamethylene diamine is produced or used to synthesize nylon-type resins. (SRC)

Section XIII. Disposal Considerations

Waste Disposal	Recycle to process, if possible. Consult your local or regional authorities. You may be able to dissolve or mix material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber system. Observe all federal, state, and local regulations when disposing of this substance.
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Section XIV. Transport Information

DOT Classification	DOT CLASS 8: Corrosive solid.
PIN Number	UN2280
Proper Shipping Name	Hexamethylenediamine, solid
Packing Group (PG)	III
DOT Pictograms	

Section XV. Other Regulatory Information and Pictograms

TSCA Chemical Inventory (EPA)	This product is ON the EPA Toxic Substances Control Act (TSCA) inventory.
WHMIS Classification (Canada)	WHMIS CLASS E: Corrosive solid.
EINECS Number (EEC)	204-679-6
EEC Risk Statements	R35- Causes severe burns. R38- Irritating to skin. R41- Risk of serious damage to eyes.
Japanese Regulatory Data	Not available.

Section XVI. Other Information

Version 1.0
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Notice to Reader

TCI laboratory chemicals are for research purposes only and are NOT intended for use as drugs, food additives, household, or pesticides. The information herein is believed to be correct, but does not claim to be all inclusive and should be used only as a guide. Neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All chemical reagents must be handled with the recognition that their chemical, physiological, toxicological, and hazardous properties have not been fully investigated or determined. All chemical reagents should be handled only by individuals who are familiar with their potential hazards and who have been fully trained in proper safety, laboratory, and chemical handling procedures. Although certain hazards are described herein, we can not guarantee that these are the only hazards which exist. Our MSDS sheets are based only on data available at the time of shipping and are subject to change without notice as new information is obtained. Avoid long storage periods since the product is subject to degradation with age and may become more dangerous or hazardous. It is the responsibility of the user to request updated MSDS sheets for products that are stored for extended periods. Disposal of unused product must be undertaken by qualified personnel who are knowledgeable in all applicable regulations and follow all pertinent safety precautions including the use of appropriate protective equipment (e.g. protective goggles, protective clothing, breathing equipment, facial mask, fume hood). For proper handling and disposal, always comply with federal, state, and local regulations.

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