

# Material Safety Data Sheet

HAZARD WARNINGS	RISK PHRASES	PROTECTIVE CLOTHING
  	<b>Environmental hazard.</b> Harmful compound, minimize exposure. Irritating to skin, eyes, and the respiratory system. <b>CARCINOGEN. MINIMIZE EXPOSURE.</b> Air and moisture sensitive material.	   

## Section I. Chemical Product and Company Identification

Chemical Name	<b>Hexamethylphosphoric Triamide</b>		
Catalog Number	H0095	Supplier	TCl America 9211 N. Harborgate St. Portland OR 1-800-423-8616
Synonym	HMPA		
Chemical Formula	C <sub>6</sub> H <sub>18</sub> N <sub>3</sub> OP		
CAS Number	680-31-9	In case of Emergency Call	<b>Chemtrec®</b> <b>(800) 424-9300 (U.S.)</b> <b>(703) 527-3887 (International)</b>

## Section II. Composition and Information on Ingredients

Chemical Name	CAS Number	Percent (%)	TLV/PEL	Toxicology Data
Hexamethylphosphoric Triamide	680-31-9	Min. 98.0 (GC,T)	This chemical is classified as a carcinogen. There is no acceptable exposure limit for a carcinogen.	Rat LD <sub>50</sub> (oral) 2650 mg/kg Mouse LD <sub>50</sub> (oral) 2400 mg/kg Rabbit LD <sub>50</sub> (dermal) 2600 mg/kg

## Section III. Hazards Identification

Acute Health Effects	Harmful if ingested or inhaled. Minimize exposure to this material. Severe overexposure can result in injury or death. Irritating to eyes and skin on contact. Inhalation causes irritation of the lungs and respiratory system. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.
Chronic Health Effects	<b>CARCINOGENIC EFFECTS</b> : Carcinogenic by RTECS Criteria. <b>MUTAGENIC EFFECTS</b> : Not available. <b>TERATOGENIC EFFECTS</b> : Tumorigenic Effects. RAT TCLo Inhalation 50 ppb/52 weeks continuous <b>TOXIC Effects:</b> Tumorigenic - Carcinogenic by RTECS criteria Sense Organs and Special Senses - Tumors <b>DEVELOPMENTAL TOXICITY</b> Reproductive Effects. Rat TDLo Intraperitoneal 43750 mg/kg, male 5 weeks prior to mating. <b>TOXIC Effects:</b> Paternal Effects - Spermatogenesis Rat TDLo Oral 2430 mg/kg, female multigenerations <b>TOXIC Effects:</b> Effects on Fertility - Female fertility index Rat TDLo Oral 2 gm/kg, male 1 day prior to mating <b>TOXIC Effects:</b> Paternal effects - testes, epididymis, sperm duct

## Section IV. First Aid Measures

Eye Contact	Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.
Skin Contact	In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.
Inhalation	If the victim is not breathing, perform mouth-to-mouth resuscitation. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, oxygen can be administered. Seek medical attention if respiration problems do not improve.
Ingestion	INDUCE VOMITING by sticking finger in throat. Lower the head so that the vomit will not reenter the mouth and throat. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. 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.

**Section V. Fire and Explosion Data**

Flammability	May be combustible at high temperature.	Auto-Ignition	Not available.
Flash Points	132°C (269.6°F).	Flammable Limits	Not available.
Combustion Products	These products are toxic carbon oxides (CO, CO <sub>2</sub> ), nitrogen oxides (NO, NO <sub>2</sub> ), phosphates.		
Fire Hazards	Not available.		
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.		
Fire Fighting Media and Instructions	SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. DO NOT use water jet. Consult with local fire authorities before attempting large scale fire-fighting operations.		

**Section VI. Accidental Release Measures**

Spill Cleanup Instructions	Environmentally hazardous material. Harmful material. Irritating material. Carcinogenic material. Air and Moisture sensitive 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.
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**Section VII. Handling and Storage**

Handling and Storage Information	ENVIRONMENTAL HAZARD. HARMFUL. IRRITANT. CARCINOGEN. AIR AND MOISTURE SENSITIVE. Keep locked up.. Keep away from heat. 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 gas/fumes/ vapor/spray. Wear suitable protective clothing. If ingested, seek medical advice immediately and show the container or the label. Treat symptomatically and supportively. Always store away from incompatible compounds such as oxidizing agents, acids.
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**Section VIII. Exposure Controls/Personal Protection**

Engineering Controls	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash station and safety shower is proximal to the work-station location.
Personal Protection	Splash goggles. Lab coat. Vapor 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	This chemical is classified as a carcinogen. There is no acceptable exposure limit for a carcinogen.

**Section IX. Physical and Chemical Properties**

Physical state @ 20°C	Liquid. (Clear light yellow.)	Solubility	Miscible with water, many organic solvents.
Specific Gravity	1.03 (water=1)		
Molecular Weight	179.2	Partition Coefficient	Not available.
Boiling Point	230 to 232°C (446 to 449.6°F)	Vapor Pressure	4 Pa (@ 20°C)
Melting Point	6°C (42.8°F) (freezing point)	Vapor Density	6.18 (Air = 1)
Refractive Index	1.457 - 1.460	Volatility	Not available.
Critical Temperature	Not available.	Odor	Aromatic.
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.
Incompatibilities	Reactive with strong oxidizing agents, strong acids.

**Section XI. Toxicological Information**

RTECS Number	TD0875000
Routes of Exposure	Eye Contact. Ingestion. Inhalation.
Toxicity Data	Rat LD <sub>50</sub> (oral) 2650 mg/kg Mouse LD <sub>50</sub> (oral) 2400 mg/kg Rabbit LD <sub>50</sub> (dermal) 2600 mg/kg
Chronic Toxic Effects	<b>CARCINOGENIC EFFECTS</b> : Carcinogenic by RTECS Criteria. <b>MUTAGENIC EFFECTS</b> : Not available. <b>TERATOGENIC EFFECTS</b> : Tumorigenic Effects. RAT TClO Inhalation 50 ppb/52 weeks continuous TOXIC Effects: Tumorigenic - Carcinogenic by RTECS criteria Sense Organs and Special Senses - Tumors <b>DEVELOPMENTAL TOXICITY</b> Reproductive Effects. Rat TDLo Intra-peritoneal 43750 mg/kg, male 5 weeks prior to mating. TOXIC Effects: Paternal Effects - Spermatogenesis Rat TDLo Oral 2430 mg/kg, female multigenerations TOXIC Effects: Effects on Fertility - Female fertility index Rat TDLo Oral 2 gm/kg, male 1 day prior to mating TOXIC Effects: Paternal effects - testes, epididymis, sperm duct
Acute Toxic Effects	Harmful if ingested or inhaled. Minimize exposure to this material. Severe overexposure can result in injury or death. Irritating to eyes and skin on contact. Inhalation causes irritation of the lungs and respiratory system. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.

**Section XII. Ecological Information**

Ecotoxicity	Not available.
Environmental Fate	Not available.

**Section XIII. Disposal Considerations**

Waste Disposal	Recycle to process, if possible. Consult your local 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 the substance.
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**Section XIV. Transport Information**

DOT Classification	DOT Class 9: Miscellaneous hazardous material
PIN Number	UN3082
Proper Shipping Name	Environmentally hazardous substance, liquid, n.o.s.
Packing Group (PG)	III
DOT Pictograms	

**Section XV. Other Regulatory Information and Pictograms**

TSCA Chemical Inventory (EPA)	This compound is <b>ON</b> the EPA Toxic Substances Control Act (TSCA) inventory list.
WHMIS Classification (Canada)	CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC). CLASS D-2B: Material causing other toxic effects (TOXIC). On NDSL
EINECS Number (EEC)	211-653-8
EEC Risk Statements	R20/21/22- Harmful by inhalation, in contact with skin and if swallowed. R36/37/38- Irritating to eyes, respiratory system and skin. R45- May cause cancer. R46- May cause heritable genetic damage. R47- May cause birth defects.
Japanese Regulatory Data	ENCS No. 2-1930

**Section XVI. Other Information****Version 1.0****Validated on 7/2/2008.****Printed 7/2/2008.****Notice to Reader**

TCI laboratory chemicals are for research purposes only and are NOT intended for use as drugs, food additives, households, 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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