

# Material Safety Data Sheet

## HEXAMETHYLENETETRAMINE

### 1. Product Identification

**Synonyms:**1,3,5,7-Tetraazatricyclo[3.3.1.1(3,7)]decane;

**Hexamethylene Tetramine**

**CAS No.:** 100-97-0

**Molecular Weight:** 140.19

**Chemical Formula:** (CH<sub>2</sub>)<sub>6</sub>H<sub>4</sub>

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### 2. Hazards Identification

#### Emergency Overview

**WARNING! FLAMMABLE SOLID. MAY BE HARMFUL IF SWALLOWED OR INHALED. MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT. MAY CAUSE SENSITIZATION BY INHALATION AND SKIN CONTACT.**

**SAF-T-DATA(tm) Ratings** (Provided here for your convenience)

**Health Rating:**3-Severe (Flammable)

**Reactivity Rating:** 1- Slight

**Contact Rating:** 3- Severe (Life)

**Lab Protective Equip:** GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER BLOVES

**Storage Color Code:** Red (Flammable)

#### Potential Health Effects

##### Inhalation:

May cause irritation to the respiratory tract. Symptoms may include coughing, sore throat, labored breathing, and chest pain. Inhalation of dust may produce an allergic reaction. The risk of allergic sensitization increases with repeated direct exposure.

##### Skin Contact:

May cause irritation with redness and pain. May produce an allergic reaction. The risk of allergic sensitization increases with repeated direct exposure.

##### Eye Contact:

May cause irritation, redness and pain.

##### Chronic Exposure:

Repeated ingestion (4-8 grams per day for 3-4 weeks) may cause symptoms

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similar to acute poisoning. Prolonged or repeated skin exposure may cause sensitization with dermatitis.

### **3. Composition/Information on Ingredients**

Ingredient	CAS No.	Percent	Hazardous
Methenamine	100-97-0	99%	Yes

### **4. First Aid Measures**

#### **Inhalation:**

Remove to fresh air. Get medical attention for any breathing difficulty.

#### **Ingestion:**

Induce vomiting immediately as directed medical personnel. Never give anything by mouth to an unconscious person. Call a physician.

#### **Skin Contact:**

Immediately flush skin with plenty of water for at least 15 minutes. Call a physician if irritation develops.

#### **Eye Contact:**

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Call a physician if irritation persists.

### **5. Fire Fighting Measures**

#### **Fire:**

Flash point: 250C (482F) CC

As with most organic solids, fire is possible at elevated temperatures or by contact with an ignition source. Burns when exposed to heat or flame.

#### **Explosion:**

Fire dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard. Above the flash point, explosive vapor-air mixtures may be formed. Sensitive to mechanical impact. Sensitive to static discharge.

#### **Fire Extinguishing Media:**

Water spray, dry chemical, alcohol foam, or carbon dioxide. Apply cooling water until well after fire is out.

#### **Special Information:**

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

## **6. Accidental Release Measures**

Remove all sources of ignition. Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8.

Spills: Clean up spills in a manner that does not disperse dust into the air. Use non-sparking tools and equipment. Reduce airborne dust and prevent scattering by moistening with water. Pick up spill for recovery or disposal and place in a closed container.

## **7. Handling and Storage**

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from any source of heat or ignition. Isolate from oxidizing materials. Containers of this material may be hazardous when empty since they retain product residues (dust, solids): observe all warnings and precautions listed for the product.

## **8. Exposure Controls / Personal Protection**

### **Airborne Exposure Limits:**

None established.

### **Ventilation System:**

A system of local and / or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

### **Personal Respirators (NIOSH Approved):**

For conditions of use where exposure to the dust or mist is apparent, a half-face dust/mist respirator may be worn. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

### **Skin Protection:**

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

### **Eye Protection:**

Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

## **9. Physical and Chemical Properties**

**Appearance:** White crystals

**Odor:** Odorless

**Solubility:** 1g soluble in 1.5 ml water

**Density:** 1.33 @ - 5C (21F)

**PH:** Aqueous solution is alkaline

**Boiling Point:** 285-295°C (Sublimes)

**Melting Point:** 263°C

**Vapor Pressure (mm Hg):** 1.0035 hPa at 20°C

**Decomposition Temperature:** 800°C (1427F)

**PH:** 8.5-9.5 (0.5M, aqueous, 20°C)

**Autoignition Temperature:** 410°C

## **10. Stability and Reactivity**

### **Stability:**

Stable under ordinary conditions of use and storage. Hygroscopic. Readily absorbs moisture from the air. Solutions are strong bases.

**Hazardous Decomposition Products:**

Carbon oxides, nitrogen oxides and formaldehyde gas form when heated to decomposition.

### **Hazardous Polymerization:**

Will not occur.

### **Incompatibilities:**

Acids, sodium peroxide, and oxidizing materials. Corrosive to some metals, such as aluminum and zinc.

### **Conditions to Avoid:**

Heat, flames, ignition sources and incompatibles.

## **11. Toxicological Information**

**Oral mouse LD50:** 560mg / kg

**INHALATION:** Dust may irritate throat and respiratory system and cause coughing. May cause sensitization by inhalation.

**INGESTION:** Irritation of the mouth, the esophagus and the gastrointestinal Tract.

## **12. Ecological Information**

**Environmental Toxicity:** 96 Hr LC50 fathead minnow: 49800



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mg/L(flow-through)

### **13. Disposal Considerations**

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal of container and unused contents in accordance with federal, state and local requirements.

### **13. Disposal Considerations**

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

### **14. Transport Information**

**Domestic (Land, D. O. T.)**

**Proper Shipping Name:** HEXAMETHYLENETETRAMINE

**Hazard Class:** 4.1

**UN / NA:** UN1328

**Packing Group:**III

**Information reported for product / size:** 2.5KG

**International (Water, I.M.O)**

### **15. Regulatory Information**

Chemical Inventory Status – Part

1. Ingredient	TSCA	EC	Japan	Australia
Methenamine (100-97-0)	Yes	Yes	Yes	Yes

2---Canada---

Ingredient	Korea	DSL	NDSL	Phil
Methenamine (100-97-0)	Yes	Yes	Yes	Yes

Federal, State & International Regulations – Part

1. SARA 302	SARA 313			
Ingredient	RQ	TPQ	List	Chemical Catg.
Methenamine(100-97-0)	No	No	No	No



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Federal, State & International Regulations – Part

2 –RCRA- -TSCA

Ingredient	CERCLA	261.33	8(d)
Methenamine(100-97-0)	No	No	No

Chemical Weapons Convention: No TSCA 12(b) No CDTA: No

SARA 311/312: Acute: Yes Chronic: Yes Fire: Yes Pressure: No

Reactivity: No (Pure / Solid)

**Australian Hazchem Code:** 1[T]

### **WHMIS:**

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

## **16. Other Information**

**NFPA Ratings:** Health: 2 Flammability: 2 Reactivity: 0

### **Label Hazard Warning:**

WARNING! FLAMMABLE SOLID. MAY BE HARMFUL IF SWALLOWED OR  
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INHALED. MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT. MAY CAUSE SENSITIZATION BY INHALATION AND SKIN CONTACT.

### **Label Precautions:**

Avoid contact with eyes, skin and clothing.

Avoid breathing dust.

Keep container closed.

Use with adequate ventilation.

Wash thoroughly after handling.

Keep away from heat, sparks and flame.

### **Label First Aid:**

If swallowed, induce vomiting immediately as directed by medical personnel.

Never give anything by mouth to an unconscious person. Call a physician. In

case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes. Call a physician if irritation develops or persists. If inhaled, remove to fresh air. Get medical attention for any breathing difficulty.

**Prepared by:** Environmental Health & Safety