# HEXAMETHYLENETETRAMINE

HMT

## CAUTIONARY RESPONSE INFORMATION

**Common Synonyms**
Aminoform
Ammonioformaldehyde
Hexa
Hexamine
Metheneamine
Urotropin

Solid crystals or powder | White | Mild ammonia odor

Sinks and mixes with water.

Avoid contact with solid and vapor.
Call fire department.
Notify local health and pollution control agencies.
Protect water intakes.

**Fire**

Combustible.
Extinguish with water, foam, dry chemical, or carbon dioxide.
Cool exposed containers with water.

**Exposure**

CALL FOR MEDICAL AID.

SOLID
Irritating to skin and eyes.
Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.

**Water Pollution**

Effect of low concentrations on aquatic life is unknown.
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

### 1. CORRECTIVE RESPONSE ACTIONS

Dilute and disperse
Stop discharge
Collection Systems: Dredge

### 2. CHEMICAL DESIGNATIONS

**2.1 CG Compatibility Group:** Not listed.
**2.2 Formula:** $C_6H_{12}N_4$
**2.3 IMO/UN Designation:** 4.1/1328
**2.4 DOT ID No.:** 1328
**2.5 CAS Registry No.:** 100-97-0
**2.6 NAERG Guide No.:** 133
**2.7 Standard Industrial Trade Classification:** 51452

### 3. HEALTH HAZARDS

**3.1 Personal Protective Equipment:** Gloves; for dusty or spatter conditions, use dust filter respirator and goggles.
**3.2 Symptoms Following Exposure:** Prolonged and repeated contact may cause skin irritation.
**3.3 Treatment of Exposure:** Wash skin or eyes thoroughly with water. Call a physician.
**3.4 TLV-TWA:** Not listed.
**3.5 TLV-STEL:** Not listed.
**3.6 TLV-Ceiling:** Not listed.
**3.7 Toxicity by Ingestion:** Grade 2; $LD_{50}$ = 0.5 to 5 g/kg (human)
**3.8 Toxicity by Inhalation:** Currently not available.
**3.9 Chronic Toxicity:** None
**3.10 Vapor (Gas) Irritant Characteristics:** Vapors are nonirritating to the eyes and throat.
**3.11 Liquid or Solid Characteristics:** Minimum hazard. If spilled on clothing and allowed to remain, may cause smarting and reddening of the skin.
**3.12 Odor Threshold:** Currently not available
**3.13 IDLH Value:** Not listed.
**3.14 OSHA PEL-TWA:** Not listed.
**3.15 OSHA PEL-STEL:** Not listed.
**3.16 OSHA PEL-Ceiling:** Not listed.
**3.17 EPA AEGL:** Not listed

### 4. FIRE HAZARDS

**4.1 Flash Point:** 482°F C.C.
**4.2 Flammable Limits in Air:** Not pertinent
**4.3 Fire Extinguishing Agents:** Water, foam, carbon dioxide, dry chemical
**4.4 Fire Extinguishing Agents Not to Be Used:** Not pertinent
**4.5 Special Hazards of Combustion Products:** Formaldehyde gas and ammonia may be given off when hot.
**4.6 Behavior in Fire:** Not pertinent
**4.7 Auto Ignition Temperature:** >700
**4.8 Electrical Hazards:** Not pertinent
**4.9 Burning Rate:** Not pertinent
**4.10 Adiabatic Flame Temperature:** Currently not available
**4.11 Stoichometric Air to Fuel Ratio:** 61.9 (calc.)
**4.12 Flame Temperature:** Currently not available
**4.13 Combustion Molar Ratio (Reactant to Product):** 16.0 (calc.)
**4.14 Minimum Oxygen Concentration for Combustion (MOCC):** Not listed

### 5. CHEMICAL REACTIVITY

**5.1 Reactivity with Water:** No reaction
**5.2 Reactivity with Common Materials:** No reaction
**5.3 Stability During Transport:** Stable
**5.4 Neutralizing Agents for Acids and Caustics:** Not pertinent
**5.5 Polymerization:** Not pertinent
**5.6 Inhibitor of Polymerization:** Not pertinent

### 6. WATER POLLUTION

**6.1 Aquatic Toxicity:** Currently not available
**6.2 Waterfowl Toxicity:** Currently not available
**6.3 Biological Oxygen Demand (BOD):** Currently not available
**6.4 Food Chain Concentration Potential:** None
**6.5 GESAMP Hazard Profile:**
**Bioaccumulation:** 0
**Damage to living resources:** 0
**Human Oral hazard:** 1
**Human Contact hazard:** II
**Reduction of amenities:** XX

### 7. SHIPPING INFORMATION

**7.1 Grades of Purity:** Technical; USP
**7.2 Storage Temperature:** Ambient
**7.3 Inert Atmosphere:** No requirement
**7.4 Venting:** Open (flame arrester)
**7.5 IMO Pollution Category:** Currently not available
**7.6 Ship Type:** Currently not available
**7.7 Barge Hull Type:** Currently not available

### 8. HAZARD CLASSIFICATIONS

**8.1 49 CFR Category:** Flammable solid
**8.2 49 CFR Class:** 4.1
**8.3 49 CFR Package Group:** III
**8.4 Marine Pollutant:** No
**8.5 NFPA Hazard Classification:** Not listed
**8.6 EPA Reportable Quantity:** Not listed.
**8.7 EPA Pollution Category:** Not listed.
**8.8 RCRA Waste Number:** Not listed
**8.9 EPA FWPCA List:** Not listed

### 9. PHYSICAL & CHEMICAL PROPERTIES

**9.1 Physical State at 15° C and 1 atm:** Solid
**9.2 Molecular Weight:** 140.19
**9.3 Boiling Point at 1 atm:** Not pertinent
**9.4 Freezing Point:** Not pertinent
**9.5 Critical Temperature:** Not pertinent
**9.6 Critical Pressure:** Not pertinent
**9.7 Specific Gravity:** 1.35 at 20°C (solid)
**9.8 Liquid Surface Tension:** Not pertinent
**9.9 Liquid Water Interfacial Tension:** Not pertinent
**9.10 Vapor (Gas) Specific Gravity:** Not pertinent
**9.11 Ratio of Specific Heats of Vapor (Gas):** Not pertinent
**9.12 Latent Heat of Vaporization:** Not pertinent
**9.13 Heat of Combustion:** –13,300 Btu/lb = –7400 cal/g = $-310 \times 10^5$ J/kg
**9.14 Heat of Decomposition:** Not pertinent
**9.15 Heat of Solution:** Not pertinent
**9.16 Heat of Polymerization:** Not pertinent
**9.17 Heat of Fusion:** Currently not available
**9.18 Limiting Value:** Currently not available
**9.19 Reid Vapor Pressure:** Currently not available

**NOTES**

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| 9.20 SATURATED LIQUID DENSITY | | 9.21 LIQUID HEAT CAPACITY | | 9.22 LIQUID THERMAL CONDUCTIVITY | | 9.23 LIQUID VISCOSITY | |
|---|---|---|---|---|---|---|---|
| Temperature (degrees F) | Pounds per cubic foot | Temperature (degrees F) | British thermal unit per pound-F | Temperature (degrees F) | British thermal unit inch per hour-square foot-F | Temperature (degrees F) | Centipoise |
| | NOT PERTINENT | | NOT PERTINENT | | NOT PERTINENT | | NOT PERTINENT |

| 9.24 SOLUBILITY IN WATER | | 9.25 SATURATED VAPOR PRESSURE | | 9.26 SATURATED VAPOR DENSITY | | 9.27 IDEAL GAS HEAT CAPACITY | |
|---|---|---|---|---|---|---|---|
| Temperature (degrees F) | Pounds per 100 pounds of water | Temperature (degrees F) | Pounds per square inch | Temperature (degrees F) | Pounds per cubic foot | Temperature (degrees F) | British thermal unit per pound-F |
| 34 | 81.259 | | NOT PERTINENT | | NOT PERTINENT | | NOT PERTINENT |
| 36 | 81.530 | | | | | | |
| 38 | 81.799 | | | | | | |
| 40 | 82.059 | | | | | | |
| 42 | 82.330 | | | | | | |
| 44 | 82.599 | | | | | | |
| 46 | 82.860 | | | | | | |
| 48 | 83.129 | | | | | | |
| 50 | 83.400 | | | | | | |
| 52 | 83.660 | | | | | | |
| 54 | 83.929 | | | | | | |
| 56 | 84.200 | | | | | | |
| 58 | 84.459 | | | | | | |
| 60 | 84.730 | | | | | | |
| 62 | 85.000 | | | | | | |
| 64 | 85.259 | | | | | | |
| 66 | 85.530 | | | | | | |
| 68 | 85.799 | | | | | | |
| 70 | 86.059 | | | | | | |
| 72 | 86.330 | | | | | | |
| 74 | 86.599 | | | | | | |
| 76 | 86.860 | | | | | | |
| 78 | 87.129 | | | | | | |
| 80 | 87.400 | | | | | | |
| 82 | 87.660 | | | | | | |
| 84 | 87.929 | | | | | | |