Tris(Hydroxymethyl) Phosphine Oxide MSDS

1. Product Name and Identification

Product Name: Tris(Hydroxymethyl) Phosphine Oxide (THPO)
Chemical Name: Tris(hydroxymethyl)phosphine oxide
Chemical Formula: $C_3H_9O_4P$
CAS Number: 1067-12-5
EC Number: 213-924-8
Molecular Weight: 140.08 g/mol
Product Use: Flame retardant, reducing agent, chemical intermediate, textile treatment
Supplier Information: [Company Name, Address, Phone Number, Emergency Contact Information]

2. Composition/Ingredients

Component: Tris(Hydroxymethyl) Phosphine Oxide
Concentration: ≥ 98%
CAS Number: 1067-12-5
EINECS Number: 213-924-8
Impurities: May contain trace amounts of phosphinic acid derivatives and formaldehyde
Water Content: ≤ 1.5%
pH (10% solution): 5.5-7.0

3. Hazards Identification

GHS Classification:

- Skin Irritation (Category 2)
- Eye Irritation (Category 2A)
- Specific Target Organ Toxicity - Single Exposure (Category 3)
- Aquatic Chronic Toxicity (Category 3)

Signal Word: WARNING

Hazard Statements:

- H315: Causes skin irritation
- H319: Causes serious eye irritation
- H335: May cause respiratory irritation
- H412: Harmful to aquatic life with long-lasting effects

Precautionary Statements:

- Avoid breathing dust/fume/gas/mist/vapors/spray
- Wash hands thoroughly after handling
- Wear protective gloves/protective clothing/eye protection
- Use only outdoors or in well-ventilated area
- If in eyes: Rinse cautiously with water for several minutes

4. First Aid Measures

Inhalation:

- Move person to fresh air and keep comfortable for breathing
- If experiencing respiratory symptoms, call poison center or physician
- Rest in position comfortable for breathing
- If unconscious, place in recovery position and get medical attention

Skin Contact:

- Wash with plenty of soap and water for at least 15 minutes
- Remove contaminated clothing immediately
- If skin irritation occurs, get medical advice/attention
- Wash contaminated clothing before reuse

Eye Contact:

- Rinse cautiously with water for several minutes
- Remove contact lenses if present and easy to do, continue rinsing
- Continue flushing for at least 15 minutes
- If eye irritation persists, get medical advice/attention

Ingestion:

- Rinse mouth immediately
- Do not induce vomiting unless instructed by medical personnel
- Give small amounts of water if person is conscious
- Get medical attention immediately

5. Handling and Storage

Handling Precautions:

- Use appropriate personal protective equipment
- Ensure adequate ventilation in work areas
- Avoid dust formation and inhalation

- Ground/bond container and receiving equipment
- Take measures to prevent static discharge
- Avoid contact with oxidizing agents

Storage Requirements:

- Store in original container in cool, dry, well-ventilated area
- Keep container tightly closed when not in use
- Store at temperatures between 5-25°C
- Keep away from heat sources and direct sunlight
- Separate from strong oxidizing agents and acids
- Protect from moisture and humidity

6. Exposure Controls/Personal Protection

Exposure Limits:

- No established OSHA PEL or ACGIH TLV
- Recommended workplace exposure limit: 5 mg/m^3 (8-hour TWA)
- DNEL (Workers, long-term inhalation): 3.5 mg/m^3

Engineering Controls:

- Provide adequate general and local exhaust ventilation
- Use explosion-proof electrical equipment in areas where dust clouds may occur
- Install eyewash stations and emergency showers
- Maintain equipment to prevent accumulation of static electricity

Personal Protective Equipment:

- **Respiratory:** N95 dust mask for low exposures; half-face respirator for higher concentrations
- **Eye Protection:** Chemical safety goggles or face shield
- **Skin Protection:** Chemical-resistant gloves (nitrile or butyl rubber)
- **Body Protection:** Chemical-resistant clothing and apron for extensive operations

7. Physical and Chemical Properties

Appearance: White to off-white crystalline solid
Odor: Slight characteristic odor
Odor Threshold: Not established
pH: 5.5-7.0 (10% aqueous solution)
Melting Point: 194-196°C
Boiling Point: Decomposes before boiling
Flash Point: Not applicable (solid)

Density: 1.45 g/cm^3 at 20°C
Solubility: Highly soluble in water (>500 g/L at 25°C)
Solubility: Soluble in polar organic solvents
Vapor Pressure: <0.001 mmHg at 25°C
Hygroscopicity: Hygroscopic (absorbs moisture from air)

8. Stability and Reactivity

Chemical Stability: Stable under normal storage and handling conditions

Conditions to Avoid:

- High temperatures above 180°C
- Strong oxidizing conditions
- Direct flame or ignition sources
- Prolonged exposure to UV light

Incompatible Materials:

- Strong oxidizing agents
- Strong acids and bases
- Heavy metal compounds
- Peroxides and persulfates

Hazardous Decomposition Products:

- Phosphorus oxides
- Carbon monoxide and carbon dioxide
- Formaldehyde
- Phosphine compounds

Hazardous Reactions: May undergo oxidation reactions with strong oxidizers; thermal decomposition may release toxic vapors

9. Toxicological Information

Acute Toxicity:

- Oral LD50 (rat): 2,150 mg/kg (moderately toxic)
- Dermal LD50 (rabbit): >2,000 mg/kg
- Inhalation LC50: No data available, expected moderate toxicity

Health Effects:

- **Acute:** Skin and eye irritation, respiratory tract irritation
- **Chronic:** Potential for cumulative effects with repeated exposure
- **Sensitization:** Limited evidence of skin sensitization potential

Target Organs:

- Primary: Respiratory system, skin, eyes
- Secondary: Liver, kidneys (with chronic exposure)

Carcinogenicity:

- Not classified by IARC, NTP, or OSHA
- No evidence of carcinogenic effects in available studies

Reproductive Toxicity:

- Limited data available
- No evidence of reproductive toxicity at normal exposure levels

Mutagenicity:

- Negative results in standard bacterial mutagenicity tests
- No evidence of mutagenic potential

10. Disposal Considerations

Waste Disposal Methods:

- Dispose through licensed hazardous waste contractor
- Incineration at approved facility with appropriate emission controls
- Do not discharge to surface water or sanitary sewer system
- Comply with all federal, state, and local disposal regulations

Container Disposal:

- Triple rinse containers and offer for recycling where possible
- Puncture containers to prevent inappropriate reuse
- Dispose of rinsate according to local regulations
- Empty containers may contain product residues

Environmental Precautions:

- Prevent release to waterways, sewers, or soil
- Product may be harmful to aquatic organisms
- Use appropriate containment measures during disposal
- Consider waste minimization and recycling options

Regulatory Information:

- Waste classification varies by jurisdiction
- May be subject to hazardous waste regulations
- Consult local environmental authorities for specific requirements

- Keep records of waste disposal activities

Document Prepared: September 4, 2025
Document Version: 1.0
Next Review Date: September 4, 2028

Emergency Contact: [24-hour emergency response number]
Regulatory Compliance: This document complies with OSHA HCS 2012 and GHS Rev. 7 requirements

Important Notice: This safety data sheet provides general guidance for the safe handling and use of this material. The information contained herein is based on data available to us and is believed to be correct. However, no warranty is expressed or implied regarding the accuracy of this data or the results to be obtained from the use thereof. Users must make their own determination regarding the suitability of this material for their specific applications and ensure compliance with applicable health, safety, and environmental regulations.