Tetrasodium Pyrophosphate MSDS

1. Product Name and Identification

Product Name: Tetrasodium Pyrophosphate (TSPP)
Chemical Name: Tetrasodium pyrophosphate
Chemical Formula: $Na_4P_2O_7$
CAS Number: 7722-88-5
EC Number: 231-767-1
Molecular Weight: 265.90 g/mol
Product Use: Detergent builder, water treatment, food additive, industrial cleaner, ceramic applications
Supplier Information: [Company Name, Address, Phone Number, Emergency Contact Information]

2. Composition/Ingredients

Component: Tetrasodium Pyrophosphate
Concentration: ≥ 95%
CAS Number: 7722-88-5
EINECS Number: 231-767-1
Impurities: May contain trace amounts of sodium orthophosphate and sodium carbonate
Water Content: ≤ 3.0%
pH (1% solution): 9.8-10.8

3. Hazards Identification

GHS Classification:

- Eye Irritation (Category 2A)
- Skin Irritation (Category 2)
- Not classified as hazardous under normal handling conditions
- GRAS (Generally Recognized as Safe) for approved food applications

Signal Word: WARNING

Hazard Statements:

- H315: Causes skin irritation
- H319: Causes serious eye irritation
- May cause respiratory tract irritation if inhaled as dust

Precautionary Statements:

- Avoid breathing dust/fume/gas/mist/vapors/spray
- Wash hands thoroughly after handling

- Wear protective gloves/protective clothing/eye protection
- If in eyes: Rinse cautiously with water for several minutes

4. First Aid Measures

Inhalation:

- Move person to fresh air and keep at rest in comfortable position
- If respiratory symptoms develop, seek medical attention
- Provide artificial respiration if breathing has stopped
- Monitor for delayed effects and seek medical advice if symptoms persist

Skin Contact:

- Wash immediately with plenty of soap and water for at least 15 minutes
- Remove contaminated clothing and footwear
- If skin irritation or rash occurs, get medical advice/attention
- Wash contaminated clothing thoroughly 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
- Get medical attention if eye irritation persists

Ingestion:

- Rinse mouth immediately with water
- Give small amounts of water to drink if person is conscious
- Do not induce vomiting unless instructed by poison control
- Seek medical attention if gastrointestinal upset occurs

5. Handling and Storage

Handling Precautions:

- Use appropriate personal protective equipment
- Minimize dust formation and avoid inhalation
- Provide adequate ventilation in handling areas
- Avoid contact with acidic materials and heavy metal compounds
- Use non-sparking tools and equipment

Storage Requirements:

- Store in original container in dry, cool, well-ventilated area
- Keep container tightly sealed to prevent moisture absorption
- Maintain storage temperature between 10-40°C
- Keep away from acidic substances and heavy metal salts
- Protect from direct sunlight and excessive heat
- Provide secondary containment for bulk storage

6. Exposure Controls/Personal Protection

Exposure Limits:

- OSHA PEL: 15 mg/m^3 (total dust), 5 mg/m^3 (respirable fraction)
- ACGIH TLV: 10 mg/m^3 (inhalable fraction), 3 mg/m^3 (respirable fraction)
- No specific exposure limits established for this substance

Engineering Controls:

- Provide adequate general ventilation
- Use local exhaust ventilation for dusty operations
- Install appropriate dust collection systems
- Ensure availability of eyewash stations and emergency showers

Personal Protective Equipment:

- **Respiratory:** N95 filtering facepiece for dusty conditions
- **Eye Protection:** Safety glasses with side shields or chemical goggles
- **Skin Protection:** Chemical-resistant gloves (nitrile recommended)
- **Body Protection:** Long-sleeved work clothing; chemical-resistant apron for bulk handling

7. Physical and Chemical Properties

Appearance: White crystalline powder or granules
Odor: Odorless
pH: 9.8-10.8 (1% aqueous solution)
Melting Point: 988°C
Boiling Point: Decomposes before boiling
Density: 2.534 g/cm^3
Bulk Density: 1.0-1.4 g/cm^3
Solubility: Highly soluble in water (65 g/L at 25°C)
Solubility: Insoluble in alcohol
Hygroscopicity: Hygroscopic (absorbs moisture from air)
Crystal Form: Monoclinic crystals

8. Stability and Reactivity

Chemical Stability: Stable under normal storage and handling conditions

Conditions to Avoid:

- Strong acidic conditions (pH < 6)
- High temperatures above 400°C
- Contact with heavy metal ions
- Prolonged exposure to moisture

Incompatible Materials:

- Strong acids
- Heavy metal salts (calcium, magnesium, iron, aluminum)
- Strong oxidizing agents
- Acidic cleaning compounds

Hazardous Decomposition Products:

- Sodium oxide
- Phosphorus pentoxide
- Water vapor
- Various sodium phosphate compounds

Hazardous Reactions: Forms insoluble precipitates with polyvalent metal ions; slow hydrolysis in neutral to acidic solutions

9. Toxicological Information

Acute Toxicity:

- Oral LD50 (rat): >4,000 mg/kg (low toxicity)
- Dermal LD50 (rabbit): Expected >2,000 mg/kg based on similar compounds
- Inhalation: Dust may cause temporary irritation of respiratory passages

Health Effects:

- **Acute:** Mild skin and eye irritation, possible respiratory irritation from dust
- **Chronic:** No known adverse health effects from normal occupational exposure
- **Carcinogenicity:** Not listed by IARC, NTP, or OSHA as carcinogenic
- **Reproductive:** No evidence of reproductive or developmental toxicity

Target Organs: None specifically identified

Additional Information:

- Approved for certain food applications under FDA regulations

- Functions as sequestering agent and pH buffer
- No evidence of bioaccumulation or environmental persistence
- Well-established safety profile for intended uses

10. Disposal Considerations

Waste Disposal Methods:

- Dispose according to federal, state, and local environmental regulations
- Generally acceptable for disposal as non-hazardous industrial waste
- Can be dissolved and disposed through wastewater treatment where permitted
- Consider recovery and recycling where economically feasible

Container Disposal:

- Empty containers may be recycled through appropriate programs
- Triple rinse containers before recycling or disposal
- No special container disposal requirements
- Follow local waste management practices

Environmental Considerations:

- Biodegradable phosphate compound
- May contribute to nutrient loading if released to water bodies
- Not expected to persist or bioaccumulate in environment
- Generally environmentally acceptable in normal use quantities

Special Considerations:

- Large spills should be contained to prevent environmental impact
- Check local regulations regarding phosphate discharge limits
- Consider beneficial reuse applications before disposal
- Material may serve as soil amendment in appropriate applications

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Emergency Information: [24-hour emergency response contact number]
Regulatory Compliance: This safety data sheet complies with OSHA HCS 2012 and GHS classification standards

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