Material Safety Data Sheet

Section I - Chemical Product And Company Identification

Product Name: Phosphoric Acid 25%
CAS Number: 7664-38-2 HBCC MSDS No. CP10400

HILL BROTHERS Chemical Co.
1675 North Main Street • Orange, California 92867
Telephone No: 714-998-8800 | Chemtrec: 800-424-9300

Section II - Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS Number</th>
<th>%</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>STEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphoric Acid</td>
<td>7664-38-2</td>
<td>25</td>
<td>1 mg/m^3</td>
<td>1 mg/m^3</td>
<td>3 mg/m^3</td>
</tr>
</tbody>
</table>

Section III - Hazard Identification

Routes of Exposure: Skin contact is expected to be the primary route of occupational exposure to Phosphoric Acid. Phosphoric Acid is considered to be corrosive to the eyes and skin. Phosphoric acid may not produce an immediate burning sensation upon skin contact, delaying the awareness of the worker that contact has occurred.

Summary of Acute Health Hazards
Ingestion: Can produce burns on the mouth and lips, severe gastrointestinal irritation, nausea, bloody diarrhea, difficult swallowing, severe abdominal pains, thirst, acidemia, difficult breathing, convulsions, collapse, shock, and death.
Inhalation: Breathing of vapor or mist is possible. Breathing this material may be harmful or fatal. Symptoms may include severe irritation and burns to the nose, throat, and respiratory tract.
Skin: May cause permanent skin burns. Phosphoric acid may not produce an immediate burning sensation upon contact, delaying the awareness of the worker that contact has occurred. Symptoms may include redness, burning, and swelling of skin, burns, and other skin damage.
Eyes: Can cause permanent eye injury. Symptoms include stinging, tearing, redness, and swelling of eyes. Can injure the cornea and cause blindness. Vapor or spray may cause eye damage, impaired sight or blindness.
Carcinogenicity Lists: No NTP: No IARC Monograph: No OSHA Regulated: Yes
Summary of Chronic Health Hazards: There is no evidence that phosphorus poisoning can result from contact with phosphoric acid. The risk of pulmonary edema resulting from the inhalation of mist or spray is remote. Prolonged inhalation may cause respiratory tract inflammation and lung damage.
Medical Conditions Generally Aggravated by Exposure: In persons with
impaired pulmonary function, especially those with obstructive airway diseases, the breathing of phosphoric acid dust or mist might cause exacerbation of symptoms due to its irritant properties. Phosphoric acid mist or solutions may cause dermatitis.

**Note to Physicians:** Preexisting disorders of the following organs (or organ systems) may be aggravated by exposure to this material: skin, lung (for example, asthma-like conditions).

### Section IV - First Aid Measures

**Ingestion:** If the victim is conscious, give the person 2 glasses of water immediately. Do NOT Induce Vomiting. Do NOT make an unconscious person vomit. GET MEDICAL ATTENTION IMMEDIATELY. If vomiting occurs, the head should be kept low so that stomach vomit doesn’t enter the lungs.

**Inhalation:** If symptoms develop, immediately move individual away from exposure and into fresh air. SEEK IMMEDIATE MEDICAL ATTENTION; keep person warm and quiet. If person is not breathing, begin artificial respiration. If breathing is difficult; administer oxygen.

**Skin:** Immediately flush skin with water for at least 15 minutes while removing contaminated clothing and shoes. SEEK IMMEDIATE MEDICAL ATTENTION. Wash clothing before reuse and decontaminate or discard contaminated shoes.

**Eyes:** If material gets into the eyes, immediately flush eyes gently with water for at least 15 minutes while holding eyelids apart. If symptoms develop as a result of vapor exposure, immediately move individual away from exposure and into fresh air before flushing as recommended above. SEEK IMMEDIATE MEDICAL ATTENTION.

### Section V - Fire Fighting Measures

**Flash Point:** Not flammable

**Autoignition Temperature:** Not flammable

**Lower Explosive Limit:** N/A

**Upper Explosive Limit:** N/A

**Unusual Fire and Explosion Hazards:** Although phosphoric acid is not combustible, it can react with metals to liberate hydrogen, a flammable gas. Never use welding or cutting torch on or near drum (even empty) because product (even just residue) can ignite explosively. Fire may produce irritating, corrosive and/or toxic gases.

**Extinguishing Media:** Use water fog or spray on fires in which phosphoric acid is involved. Use water fog to keep fire-exposed containers cool. Carbon dioxide (CO2). Dry chemical powder. Foam.

**Special Firefighting Procedures:** Under fire conditions, toxic vapors may be formed. Water may be used to extinguish fire by cooling, and diluting liquid with water. Wear a self-contained breathing apparatus with a full facepiece operated in the positive-pressure demand mode with appropriate turn-out gear and chemical resistant personal protective equipment.

### Section VI - Accidental Release Measures

**Small Spill:** Cover the contaminated surface with sodium bicarbonate or a soda ash/flaked lime mixture (50-50). Mix and add water if necessary to form a slurry. Scoop up slurry and wash site with soda ash solution. Proper mixing procedures are essential. Trained personnel should conduct this procedure. Untrained personnel should be removed from the spill area.

**Large Spill:** Persons not wearing protective equipment should be excluded from area of spill until clean-up is completed. Stop spill at source. Dike to prevent spreading. Pump to salvage tank. Local authorities should be advised if significant spillages cannot be contained. Do not flush in sewer.
Section VII - Handling and Storage

Do not get in eyes, on skin, or on clothing, and avoid breathing the mist. Keep containers closed, and use with adequate ventilation. Wash thoroughly after handling. Empty containers may retain vapor and product residue. Observe all labeled safeguards until container is cleaned, reconditioned or destroyed. Store in rubber-lined or 316 stainless steel tanks designed for phosphoric acid. Store drums away from heat and out of direct sunlight. Addition to water releases heat which can result in violent boiling and splattering. Always add slowly and in small amounts. Never use hot water. Never add water to acids. Always add acids to water.

Section VIII - Exposure Controls/Personal Protection

Respiratory Protection: Use only a MSHA/NIOSH-approved respirator to prevent overexposure if vapor levels may or do exceed the exposure limits.

Respirator Selection:
50 mg/m³: HiEPF/SAF/SCBAF
2000 mg/m³: SAF: PD, PP, CF

Ventilation: This product should be confined within closed equipment, in which case general (mechanical) room ventilation (typically 10 air changes per hour) should be suitable. Special, local ventilation is needed at points where vapors are expected to be vented to the workplace air. Consult NFPA Standard 91 for design of exhaust systems.

Protective Clothing: Avoid contact with the eyes. Wear chemical splash goggles and face shield (8" min.). Wear appropriate impervious gloves (neoprene, nitrile rubber, polyvinyl chloride, polyethylene) and protective clothing and boots to prevent skin contact. Wear face shields and impervious aprons when splashing is likely. Remove contaminated clothing promptly and launder before reuse.

Other Protective Clothing or Equipment: Have eye baths and safety showers immediately available where eye contact and skin contact can occur. Use only under a chemical fume hood.

Work/Hygienic Practices: All employees who handle phosphoric acid should wash their hands before eating, smoking, or using the toilet facilities. Do NOT place food, coffee or other drinks in the area where dusting or splashing of solutions is possible.

Section IX - Physical and Chemical Properties

Physical State: Liquid
pH: 0.45
Boiling Point/Range: 100°C; 212°F @ 760mmHg

Appearance/Color/Odor: Clear, colorless, odorless, syrupy liquid

Solubility in Water: 100%
Vapor Pressure (mmHg): 17.5 @ 20°C; 68°F

Specific Gravity (Water=1): 1.158
Lbs./Gallon: 9.66

Vapor Density (Air=1): 0.6
% Volatiles (by volume): 100

Molecular Weight: N/A
Freezing Point: N/A

How to detect this compound in air: Collection on a cellulose membrane filter, workup with water, colorimetric determination.
Section X - Stability and Reactivity

**Stability:** Stable  
**Hazardous Polymerization:** Does not occur.

**Conditions to Avoid:** Excess heat, and exposure to moist air or water.

**Materials to Avoid:** Contact with strong caustics can cause liberation of much heat and violent spattering. Contact with most metals causes formation of flammable and explosive hydrogen gas. Avoid contact with materials such as sulfides and sulfites which could release toxic gases, and be cautious in mixing with strong bases because high heat of reaction can generate steam. Severely corrosive to steel based on DOT, 49 CFR criteria. Potentially violent reaction with sodium tetrahydroborate. Reacts with chloride + stainless steel to form explosive hydrogen gas. Mixtures with nitromethane are explosive.

**Incompatible with these materials:** Metals, bases, alkalies (organic), ammonia, alcohols, amines, halogenated agents, organic peroxides/hydroperoxides, amides, azo, diazo, and hydrazines (e.g. dimethyl hydrazine, hydrazine, methylhydrazine), carbamates (e.g. carbanolate, carbofuran), esters (e.g. butyl acetate, ethyl acetate, propyl formate), fluorides (inorganic, e.g. ammonium fluoride, calcium fluoride, cesium fluoride), phenols and cresols, organophosphates (e.g. methylparathion, parathion, phorate, thionazin), epoxides (butyl glycidyl ether), combustible and flammable materials (e.g. alkyl resins asphalt, gasoline, grease, methyl acetone, polystyrene, polyurethane), nitromethane, sodium tetrahydroborate, mercaptans, aldehydes, ketones, glycols, cyanides, sulfides, caustics.

**Hazardous Decomposition Products:** Toxic gases and vapors (such as phosphoric acid fume) may be released when phosphoric acid decomposes. Phosphine, oxides of phosphorus, hydrogen gas.

Section XI - Toxicological Information

**Toxicity Data:** Oral Toxicity: LD50 (Rat) - 1530 mg/kg  
Skin: LD50 (Rabbit) 2740 mg/kg (Slightly toxic)

**Summary of Toxicology:** Phosphoric acid mist is an irritant to the eyes, upper respiratory tract, and skin. The solid is especially irritating to the skin in the presence of moisture. Non-acclimated workers could not endure exposure to fumes of phosphorus pentoxide (the anhydride of phosphoric acid) at a concentration of 100 mg/m³; exposure to concentrations between 3.6 and 11.3 mg/m³ produced coughing. Concentrations of 0.8 to 5.4 mg/m³ were noticeable but not uncomfortable. There is no evidence that phosphorus poisoning can result from contact with phosphoric acid. The risk of pulmonary edema resulting from the inhalation of mist or spray is remote. A dilute solution buffered to pH 2.5 caused a moderate brief stinging sensation but no injury when dropped in the human eye. A 75% solution will cause severe skin burns.

Section XII - Ecological Information

When released into the soil this material may leach into groundwater. When released to water, natural waters hardness minerals may readily reduce acidity. Phosphate may persist indefinitely. During transport through the soil, phosphoric acid will dissolve some of the soil material, in particular, carbonate-based materials. The acid will be neutralized to some degree with adsorption of the proton and phosphate ions also possible. However significant amounts of acid will remain for transport down toward the groundwater table. The product may affect the acidity (pH-factor) in water with risk of harmful effects to aquatic organisms.

**Product Name:** Phosphoric Acid 25%
Section XIII - Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste 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 in accordance with applicable local, county, state and federal regulations. Neutralization by a waste treatment facility is recommended.

Section XIV - Transport Information

DOT Proper Shipping Name: Phosphoric Acid Solution
DOT Hazard Class/ I.D. No.: 8, UN1805, PG III

Section XV – Regulatory Information

WARNING
This product may contain trace levels of Lead and Cadmium which the State of California has found to cause cancer, birth defects and other reproductive harm.

Reportable Quantity: 5,000 Pounds (2270 Kilograms) (318.27 Gals)

NFPA Rating: Health - 3; Flammability - 0; Instability – 0
0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme


Carcinogenicity Lists:
NTP: No
IARC Monograph: No
OSHA Regulated: Yes

Section 313 Supplier Notification: This product contains the following toxic chemical(s) subject to the reporting requirements of SARA TITLE III Section 313 of the Emergency Planning and Community Right-To Know Act of 1986 and of 40 CFR 372:

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<td>Phosphoric Acid</td>
<td>25%</td>
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Section XVI - Other Information

Synonyms/Common Names: O-Phosphoric Acid, White Phosphoric Acid, M-Phosphoric Acid

Chemical Family/Type: Mineral Acid

Sections changed since last revision: First Issue

IMPORTANT! Read this MSDS before use or disposal of this product. Pass along the information to employees and any other persons who could be exposed to the product to be sure that they are aware of the information before use or other exposure. This MSDS has been prepared according to the OSHA Hazard Communication Standard [29 CFR 1910.1200]. The MSDS information is based on sources believed to be reliable. However, since data, safety standards, and government regulations are subject to change and the conditions of handling and use, or misuse are beyond our control, Hill Brothers Chemical Company makes no warranty, either expressed or implied, with respect to the completeness or continuing accuracy of the information contained herein and disclaims all liability for reliance thereon. Also, additional information may be necessary or helpful for specific conditions and circumstances of use. It is the user's responsibility to determine the suitability of this product and to evaluate risks prior to use, and then to exercise appropriate precautions for protection of employees and others.

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