Material Safety Data Sheet

Revision Issued: 6/19/2008 Supercedes: 7/20/2004 First Issued: 6/24/1987

Section I - Chemical Product And Company Identification

Product Name: Phosphoric Acid

CAS Number: 7664-38-2 HBCC MSDS No. CP10000

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Section II - Composition / Information on Ingredients

			Exposure Limits (TWAs) in Air		
Chemical Name	CAS Number	%	ACGIH TLV	OSHA PEL	STEL
Phosphoric Acid	7664-38-2	75-85	1 mg/m³	1 mg/m³	3 mg/m³

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.

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.
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.

Extinguishing Media: Use water fog on fires in which phosphoric acid is involved. Use water fog to keep fire-exposed containers cool.

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.

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. See SUPPLEMENTAL INFORMATION.

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 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: N/A

Melting Point/Range: 42.35°C

Boiling Point/Range: 158°C; 316°F @ 760mmHg

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

Solubility in Water: 100%

Vapor Pressure (mmHg): 0.0285 @ 20°C; 68°F

Specific Gravity (Water=1):
1.575 for 75% Phosphoric Acid
1.692 for 85% Phosphoric Acid

Lbs./Gallon:
13.17 for 75% Phosphoric Acid
14.15 for 85% Phosphoric Acid

Vapor Density (Air=1): 3.4

% Volatiles (by volume): 100

Viscosity @ 25°C (Centistokes): 12

Molecular Weight: 98.00

Freezing Point: -17.5°C for 75% Phosphoric Acid; 21.1°C for 85% Phosphoric Acid

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: May 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, alcohols, amines, halogenated agents, organic peroxides, 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/m^3; exposure to concentrations between 3.6 and 11.3 mg/m^3 produced coughing. Concentrations of 0.8 to 5.4 mg/m^3 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.

Section XIII - Disposal Considerations

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 - 1
0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme
Uniform Fire Code Rating: Class 3 Water-Reactive Material.
Carcinogenicity Lists: NTP: No **IARC Monograph:** No **OSHA Regulated:** Yes

Section 313 Supplier Notification: This product contains the following toxic chemcial(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:

CAS #	Chemical Name	% By Weight
7664-38-2	Phosphoric Acid	75-85%

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: III, V, VIII, IX, X, XII, XIV, XV

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.