



SAFETY DATA SHEET

PRODUCT NAME: Phosphoric Acid

July 2013

IDENTIFICATION

Product Name: Phosphoric Acid
Other Names: Orthophosphoric Acid
Product Code: CPA1, CPA21, ZPHOSA
Uses: Manufacture of super phosphate fertilizers, phosphate salts, detergents. Used as an acid catalyst in ethylene and purifying hydrogen peroxide. Used in dental cement, process engraving and as an analytical agent. In food and soft drinks for sharp taste.

Supplier: HamChem Hamilton Chemicals Ltd, 355 Kahikatea Drive, Hamilton
Phone: 078475840, Fax 078475882, info@hamchem.co.nz

- In emergency dial 111, and then ask for Fire, Ambulance or Police as necessary.
- In case of poisoning phone National Poisons Centre – 0800 764 766

HAZARD IDENTIFICATION

DANGER

Keep out of reach of children

Read label and SDS thoroughly before use.

HSNO Classifications: 6.1D, 8.1A, 8.2C, 8.3A, 9.1D, 9.3C

Transport: 8

Hazard Statements: Harmful if swallowed. May be corrosive to metals. Causes severe skin burns and serious eye damage. Harmful to aquatic life. Harmful to terrestrial vertebrates.

Preventions: Do not breathe mist/vapours/spray. Do not eat, drink or smoke when using this product. Wash all parts of the body that have come into contact thoroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection. Store locked up in original container. Store in a corrosive resistant container with a resistant liner. Avoid release to the environment. Collect spillage. Do not breathe mist or dust.

Response:

IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing. Wash contaminated clothing before reuse.

Wear eye/face protection. If eye irritation persists, get medical advice/attention.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

Absorb spillage to prevent material damage. Immediately call a POISON CENTRE or doctor/physician.

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If on skin/hair: remove/take off immediately all contaminated clothing. Rinse with water/shower.

Storage: Store locked up. Store in a corrosive resistant container with a resistant inliner.

Disposal: Dispose of contents and container in accordance with relevant legislation.

COMPOSITION & INFORMATION ON INGREDIENTS

Chemical Entity	CAS No.	Proportion (%)
Phosphoric Acid	7664-38-2	> 75%
Water	7732-18-5	< 25%

FIRST AID MEASURES

If swallowed: For advice contact the National Poison Centre or a Doctor at once. Urgent hospital treatment is likely to be needed. If swallowed do NOT induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration. Observe the patient carefully. Never give liquid to a person showing signs of being sleepy or with reduced awareness e.g. losing consciousness. Give water to rinse out mouth, and then provide liquid slowly. Transport to hospital or Doctor without delay.

If on skin: Immediately flush body and clothes with large amounts of water, using safety shower if available. Quickly remove contaminated clothing, including footwear. Wash skin and hair with running water. Continue flushing with water until advised to stop by the National Poison Information Centre. Transport to a hospital, Doctor if irritation persists.

If inhaled: If fumes or combustion products are inhaled, remove from contaminated area. Lay patient down, keep warm, rested and in a position comfortable for breathing. Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures. Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary. Transport to hospital or Doctor without delay.

If in eyes: Immediately hold eyelids apart and flush the eye continuously with running water. Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids (lifting the upper and lower lids) occasionally. Continue flushing for at least 15 minutes (as long as possible, preferably). Transport to hospital or Doctor without delay. Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

Note to Physician: For acute or short term repeated exposures to strong acids – Airway problems may arise from laryngeal edema and inhalation exposure. Treat with 100% oxygen initially. Respiratory distress may require cricothyroidotomy if endotracheal intubation is contraindicated by excessive swelling. Intravenous lines should be established immediately in all cases where there is evidence of circulatory compromise. Strong acids produce a coagulation necrosis characterised by formation of a coagulum (eschar) as a result of the dessicating action of the acid on proteins in specific tissues. Ingestion – Immediate dilution (milk or water) within 30 minutes post ingestion is recommended. Do NOT attempt to neutralize the acid since exothermic reaction may extend the corrosive injury. Be careful to avoid further vomit since re-exposure of the

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mucosa to the acid is harmful. Limit fluid to one to two glasses in an adult. Charcoal has no place in acid management. Skin – Skin lesions require copious saline irrigation. Treat chemical burns as thermal burns with non-adherent gauze and wrapping. Deep second-degree burns may benefit from topical silver sulfadiazine. Eye – Eye injuries require retraction of the eyelids to ensure thorough irrigation of the conjunctival cul-de-sacs. Irrigation should last at least 20-30 minutes. Do NOT use neutralizing agents or any other additives. Several litres of saline are required. Cycloplegic drops, (1% cyclopentolate for short term use or 5% homatropine for longer term use) antibiotic drops, vasoconstrictive agents or artificial tears may be indicated dependant on the severity of the injury. Steroid eye drops should only be administered with the approval of a consulting ophthalmologist.

SYMPTOMS AND EFFECTS, ACUTE AND DELAYED, FROM EXPOSURE

Ingestion: Accidental ingestion of the material may be harmful; animal experiments indicate that the ingestion of less than 150gram may be fatal or may produce serious damage to the health of the individual. The material can produce chemical burns within the oral cavity and gastrointestinal tract following ingestion.

Skin contact: Skin contact with the material may damage the health of the individual; systemic effects may result following absorption. The material can produce chemical burns following direct contact with the skin. The material may cause moderate inflammation of the skin either following direct contact or after a delay of some time. Repeated exposure can cause contact dermatitis which is characterized by redness, swelling and blistering. Entry into the blood stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

Inhalation: Inhalation of aerosols (mist, fumes), generated by the material during the course of normal handling, may produce serious damage to the health of the individual. High concentrations cause inflamed airways and watery swelling of the lungs with oedema.

Eye contact: The material can produce chemical burns to the eye following direct contact. Vapours or mists may be extremely irritating. If applied to the eyes, this material causes severe eye damage.

Long term effects: Repeated or prolonged exposure to acids may result in the erosion of teeth, swelling and/or ulceration of the mouth lining. Irritation of airways to lung, with cough, and inflammation of lung tissue often occurs. Chronic exposure may inflame the skin or conjunctiva. Substance accumulation, in the human body, may occur and cause some concern following repeated or long-term occupational exposure. Sodium phosphate dibasic can causes stones in the kidney, loss of mineral from the bones and loss of thyroid gland function.

FIRE FIGHTING MEASURES

Extinguishing media: Water spray or fog, foam, dry chemical powder, carbon dioxide.

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Fire fighting: Alert Fire Brigade and tell them location and nature of hazard. Wear full body protective clothing with breathing apparatus. Prevent, by any means available, spillage from entering drains or water course. Use fire fighting procedures suitable for surrounding area. Do not approach containers suspected to be hot. Cool fire exposed containers with water spray from a protected location. If safe to do so, remove containers from path of fire. Equipment should be thoroughly decontaminated after use.

Fire/explosion hazard: Non combustible. Not considered to be a significant fire risk. Acids may react with metals to produce hydrogen, a highly flammable and explosive gas. Heating may cause expansion or decomposition leading to violent rupture of containers. May emit corrosive, poisonous fumes. May emit acrid smoke. Decomposition may produce toxic fumes of: phosphorus oxides (Pox).

Fire incompatibility: None known.

Personal Protective Equipment: Breathing apparatus. Chemical splash suit.

ACCIDENTAL RELEASE MEASURES

Minor spills: Environmental hazard – contain spillage. Clean up all spills immediately. Avoid breathing vapours and contact with skin and eyes. Control personal contact by using protective equipment. Contain and absorb spill with sand, earth, inert material or vermiculite. Wipe up. Place in a suitable labeled container for waste disposal.

Major spills: Environmental hazard – contain spillage. Chemical class: acidic compounds, inorganic. For release onto land: recommended sorbents listed in order of priority. Clear area of personnel and move upwind. Alert Fire Brigade and tell them location and nature of hazard. Wear full body protective clothing with breathing apparatus. Prevent, by any means available, spillage from entering drains or water course. Stop leak if safe to do so. Contain spill with sand, earth and vermiculite. Collect recoverable product onto labeled containers for recycling. Neutralize/decontaminate residue. Collect solid residues and seal in labeled drums for disposal. Wash area and prevent runoff into drains. After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using. If contamination of drains or waterways occurs, advise emergency services.

EMERGENCY RESPONSE PLANNING GUIDELINE (ERPG)

- The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour WITHOUT experiencing or developing life-threatening health effects is:

Phosphoric acid: 500 mg/m³

- Irreversible or other serious effects or symptoms which could impair an individual's ability to take protective action is:

Phosphoric acid: 5 mg/m³

- Other than mild, transient adverse effects without perceiving a clearly defined odour is:

Phosphoric acid: 3 mg/m³

- The threshold concentration below which most people experience no appreciable risk of health effects:

Phosphoric acid: 1 mg/m³

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HANDLING & STORAGE

Procedure for handling: DO NOT allow clothing wet with material to stay in contact with skin. Avoid all personal contact, including inhalation. Wear protective clothing when risk of exposure occurs. Use in a well-ventilated area. When handling, DO NOT eat, drink or smoke. Keep containers securely sealed when not in use. Avoid physical damage to containers. Always wash hands with soap and water after handling. Work clothes should be laundered separately. Launder contaminated clothing before re-use. Use good occupational work practice. Observe manufacturer's storing and handling recommendations. Atmosphere should be regularly checked against established exposure.

Suitable container: Packaging as recommended by manufacturer. Check that containers are clearly labeled. DO NOT use aluminium or galvanized containers. Glass container, lined metal can, lined metal pail/can, plastic pail, polyliner drum.

Storage incompatibility: Reacts vigorously with alkalis. Reacts with mild steel, galvanized steel/zinc producing hydrogen gas which may form an explosive mixture with air. Avoid strong bases.

Storage requirements: Store in original containers. Keep containers securely sealed. Store in a cool, dry, well-ventilated area. Store away from incompatible materials and foodstuff containers. Protect containers against physical damage and check regularly for leaks. Observe manufacturer's storing and handling recommendations.

* Inorganic acids are generally soluble in water with the release of hydrogen ions. The resulting solutions have pH's of less than 7.0. Inorganic acids neutralise chemical bases (for example: amines and inorganic hydroxides) to form salts. Neutralisation can generate dangerously large amounts of heat in small spaces. The dissolution of inorganic acids in water or the dilution of their concentrated solutions with additional water may generate significant heat. The addition of water to inorganic acids often generates sufficient heat in the small region of mixing to cause some of the water to boil explosively. The resulting 'bumping' can spatter the acid. Inorganic acids react with active metals, including such structural metals as aluminum and iron, to release hydrogen, a flammable gas.

EXPOSURE CONTROLS & PERSONAL PROTECTION
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Exposure standards: WES – TWA 1mg/m³

Material data: The saturated vapour concentration of phosphoric acid exceeds the TLV. The TLV-TWA is based by analogy from comparable experience and data for sulfuric acid. Exposure at or below this limit is thought to prevent throat irritation amongst acclimatized workers. Fumes of phosphorus pentoxide at concentrations between 0.8 and 5.4 mg/m³ were reported to be noticeable but not uncomfortable whilst concentrations between 3.6 and 11.3 mg/m³ produced coughing in unacclimatised workers but were tolerable. Concentrations of 100 mg/m³ were unbearable except in inured workers.

PERSONAL PROTECTION EQUIPMENT (PPE)

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Airborne exposure limits: None known.

Ventilation system: A system of local and/or general exhaust is recommended to keep employee exposure as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal respirators (NIOSH Approved): For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. **WARNING:** Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin protection: Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye protection: Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

PHYSICAL & CHEMICAL PROPERTIES

Appearance:	Colourless, transparent and syrupy liquid
Odour:	Odourless
Specific Gravity:	1.69
Solubility:	Miscible
Flash point:	Non flammable
Flammability limits:	Not applicable
Boiling point:	135-154°C
Melting point:	21-17.5°C
pH (1% solution):	1.5
Molecular weight:	98.00

STABILITY & REACTIVITY

Chemical stability: Stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Conditions to avoid: Avoid contact with foodstuffs.

Incompatible materials: Incompatible with alkalis, oxidising agents, and metals.

Hazardous decomposition products: Oxides of phosphorus.

Hazardous reactions: Reacts with metals liberating flammable hydrogen gas.

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TOXICOLOGICAL INFORMATION

ACUTE HEALTH EFFECTS

Swallowed: Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual. The material can produce chemical burns within the oral cavity and gastrointestinal tract following ingestion.

Eye: The material can produce chemical burns to the eye following direct contact. Vapours or mists may be extremely irritating. If applied to the eyes, this material causes severe eye damage.

Skin: Skin contact with the material may damage the health of the individual; systematic effects may result following absorption. The material can produce chemical burns following direct contact with the skin. The material may cause moderate inflammation of the skin either following direct contact or after a delay of some time. Repeated exposure can cause contact dermatitis which is characterized by redness, swelling and blistering. Entry into the blood stream, through, for example, cuts, abrasions or lesions, may produce systematic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

Inhaled: Inhalation of aerosols (mists, fumes), generated by the material during the course of normal handling, may produce serious damage to the health of the individual. High concentrations cause inflamed airways and watery swelling of the lungs with oedema.

CHRONIC HEALTH EFFECTS

Repeated or prolonged exposure to acids may result in the erosion of teeth, swelling and/or ulceration of mouth lining. Irritation of airways to lung, with cough, and inflammation of lung tissue often occurs. Chronic exposure may inflame the skin or conjunctiva. Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure. Sodium phosphate dibasic can cause stones in the kidney, loss of mineral from the bones and loss of thyroid gland function.

TOXICITY AND IRRITATION

Toxicity:

Species: Rat. Endpoint: LD50 Value: 1530 mg/kg
Reference source: Grande Paroisse SA Paris la Defense 5 TRGS 900 (1993) [IUCLID 2000]

Species: Rabbit Endpoint: LD50 Value: 2740 mg/kg
Reference source: Grande Paroisse SA Paris la Defense 5 TRGS 900 (1993) [IUCLID 2000]

Species: Rabbit. Result: Corrosive.
Reference source: Grand Paroisse SA Paris la Defense 5 Skin irritation tests on various concentrations of phosphoric acid, Randall, D.J., Robinson, E.C., Acute Tox. Data 1 (1), 68-9, 1990 [IUCLID 2000]

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Irritation:

Species: Rabbit Result: Severely irritating.
Reference source: Payne MP, Shillaker RO, Wilson AJ. Source: TA:HSE Toxicity Review PG:22
p YR:1993 IP: VI:30 [Toxline]

ECOLOGICAL INFORMATION

Fish LC50 (96h.) (mg/l): 138
Species: Rat
Endpoint: LD50
Value: 1530 mg/kg bw
Reference source: Grande Paroisse SA Paris la Defense 5 TRGS 900 (1993) [IUCLID 2000]

*On the basis of available evidence concerning toxicity, persistence, potential to accumulate and or observed environmental fate and behaviour, the material may present a danger, immediate or long-term and/or delayed, to the structure and/or functioning of natural ecosystems. Prevent, by any means available, spillage from entering drains or waterways. Do NOT allow product to come in contact with surface waters or to intertidal area below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment wash-waters. Wastes resulting from the use of the product must be disposed of on site or at approved waste sites. Do NOT discharge into sewer or waterways. Phosphoric acid salts (phosphates) induces eutrofication of waterways.

DISPOSAL CONSIDERATIONS

Recycle wherever possible. Bury residue in an authorized landfill. Recycle containers if possible, or dispose of in an authorized landfill. Containers may still present a chemical hazard/danger when empty. Otherwise: If container cannot be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorized landfill. Contact appropriate Waste Management Company for guidance and disposal options in your area. Where possible retain label warnings and SDS and observe all notices pertaining to the product. For further information on disposal and specific advice on controls required for materials used in New Zealand consult <http://www.epa.govt.nz/search-databases/Pages/controls-details.aspx?SubstanceID=666&AppID=3280>

TRANSPORT INFORMATION

UN Number:	1805
Proper Shipping name:	Phosphoric Acid, Solution
Dangerous Goods Class:	8 - Corrosive
Packing group:	III
Hazchem Code:	2R

REGULATORY INFORMATION

HSNO Classifications: 6.1D, 8.1A, 8.2C, 8.3A, 9.1D, 9.3C

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OTHER INFORMATION

Key to abbreviations:

End of SDS.

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