TENNANTS DISTRIBUTION LIMITED
HAZELBOTTOM ROAD, CHEETHAM, MANCHESTER M8 0GR TEL 44(0)161 205 4454 FAX 44(0)161 203 4298

PRODUCT SPECIFICATION

Product Name	Phosphoric Acid Pure
Product Grade	This product is suitable as a food additive
Product Specification	PHACPU/7 (16/03/SK)

SALES SPECIFICATION

	Pure Grade 85%	Pure Grade 75%	Pure Grade 81.5%	Pure Grade 67%	Pure Grade 25%
Chemical Formula	H_3PO_4	H_3PO_4	H_3PO_4	H_3PO_4	H_3PO_4
Appearance	Clear liquid	Clear liquid	Clear liquid	Clear liquid	Clear liquid
H_3PO_4 content	85% ± 0.3%	75% ± 0.5%	81.5% ± 0.5%	67% ± 0.5%	25.0± 1.0%
P_2O_5	61.6% ± 0.3%	54.3% ± 0.4%	60.1% ± 0.4%	48.5% ± 0.4%	18.1± 1.0%
Freezing Point (°C)	+21	-20	+7	No data	-9
S.G. Approx.	1.686	1.574	1.644	1.500	1.19
As	0.5 ppm max	0.5 ppm max	0.5 ppm max	0.5 ppm max	0.5 ppm max
Cd	0.2 ppm max	0.2 ppm max	0.2 ppm max	0.2 ppm max	0.2 ppm max
Ca	10.0 ppm max	10.0 ppm max	10.0 ppm max	10.0 ppm max	10.0 ppm max
Cl	7.0 ppm max	7.0 ppm max	7.0 ppm max	7.0 ppm max	7.0 ppm max
Cr	1.0 ppm max	1.5 ppm max	1.5 ppm max	1.5 ppm max	1.5 ppm max
Cu	0.7 ppm max	0.7 ppm max	0.7 ppm max	0.7 ppm max	0.7 ppm max
F	10.0 ppm max	10.0 ppm max	10.0 ppm max	10.0 ppm max	10.0 ppm max
Fe	5.0 ppm max	5.0 ppm max	5.0 ppm max	5.0 ppm max	5.0 ppm max
Hg	0.1 ppm max	0.1 ppm max	0.1 ppm max	0.1 ppm max	0.1 ppm max
Ni	0.5 ppm max	0.5 ppm max	0.5 ppm max	0.5 ppm max	0.5 ppm max
Sb	4 ppm max	4 ppm max	4 ppm max	4 ppm max	4 ppm max
Se	1 ppm max	1 ppm max	1 ppm max	1 ppm max	1 ppm max
SO4	109.0 ppm max	109.0 ppm max	109.0 ppm max	109.0 ppm max	109.0 ppm max
V	1.0 ppm max	1.0 ppm max	1.0 ppm max	1.0 ppm max	1.0 ppm max
Pb	0.3 ppm max	0.3 ppm max	0.3 ppm max	0.3 ppm max	0.3 ppm max
Nitrate	<5 ppm	<5 ppm	<5 ppm	<5 ppm	<5 ppm
Volatile Acids	<10 ppm	<10 ppm	<10 ppm	<10 ppm	<10 ppm
Heavy Metals as Pb	5.0 ppm max	5.0 ppm max	5.0 ppm max	5.0 ppm max	5.0 ppm max
Colour Absorption at 418 nm	20 ppm max	20 ppm max	20 ppm max	20 ppm max	20 ppm max

Applications

Typical examples: production of phosphate salts, detergents and cleaners, metal treatment, food additives, cane sugar, pet food proteins, fermentation, liquid fertilizers, textile fibres, sewage treatment, ceramics, paints enamels, vegetable oil degumming and pigment production

Compliance

Our phosphoric acid fully complies with BS EN 974:2003 and DIN EN 974:2004 specifying the purity requirements for phosphoric acid used for the treatment of water intended for human consumption.
Our purified phosphoric acid meets the requirements of current European regulations (Directive 2012/231/EU) and FCC 8.
Our phosphoric acid is produced out of phosphate rock, sulphuric acid, hydrochloric acid and other natural or synthetic raw materials, which none of them is floral or animal or any biological origin. No animal derived material are used during manufacturing process.

NOTES

Exclusion of Liability

Information contained in this publication is accurate to the best of the knowledge and belief of Tennants.

Any information or advice obtained from Tennants otherwise than by means of this publication and whether relating to Tennants materials or other materials, is also given in good faith. However, it remains at all times the responsibility of the customer to ensure that Tennants materials are suitable for the particular purpose intended.

Tennants accepts no liability whatsoever (except as otherwise provided by law) arising out of the use of information supplied, the application, adaptation or processing of the products described herein, the use of other materials in lieu of Tennants materials or the use of Tennants materials in conjunction with such other materials.

Health and Safety

A Material Safety Data Sheet has been issued describing the health, safety and environmental properties of this product,

identifying the potential hazards and giving advice on the handling precautions and emergency procedures. This must be consulted fully before handling, storage and use.

SAFETY DATA SHEET

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY

1.1 Product identifier

Trade name:	Phosphoric acid 25-93%, food grade
Synonyms:	Orthophosphoric acid 25-93%
CAS No.	7664-38-2
EC No.	231-633-2
Index No.	015-011-00-6
Tariff No.	28092000
REACH Registration No.	01-2119485924-24-XXXX

1.2 Relevant identified uses of the substance or mixture and uses advised against

Relevant Identified Uses:
Food additives
Intermediate
Laboratory chemicals
Descaling compound/ Scale solvent
Corrosion inhibitors
pH-corrective agent
Processing aid
Degreasing agent
Fertilizer
Metal surface treatment
No uses advised against.

1.3 Details of the supplier of the safety data sheet

TENNANTS DISTRIBUTION LIMITED
Hazelbottom Road
Manchester
M8 0GR
Tel No. 44(0)161 205 4454
Fax No. 44(0)161 203 4298

Emergency Tel No.	44(0)844 335 0001 (24 hrs)
Email:	msds@tennantsdistribution.com

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

Met. Corr.1 H290 May be corrosive to metals.
Skin Corr. 1B H314 Causes severe skin burns and eye damage.
Acute Tox. Oral. 4 H302 Harmful if swallowed

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008

The substance is classified and labelled according to the CLP regulation.
Hazard pictograms

Signal Word: Danger

Hazard Statements

H290 May be corrosive to metals.
H302 Harmful if swallowed.
H314 Causes severe skin burns and eye damage.

Precautionary statements

P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P280 Wear protective gloves/protective clothing/eye protection/face protection.

P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P301+P330+P331 IF SWALLOWED: rinse mouth. Do NOT induce vomiting.

2.3 Other hazards

Results of PBT and vPvB assessment

PBT: Not applicable.
vPvB: Not applicable.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

CAS No.	7664-38-2
Description	Orthophosphoric acid 25-93%
EC number:	231-633-2
Index number:	015-011-00-6
SVHC	None
REACH Registration No.	01-2119485924-24-XXXX

4. FIRST AID MEASURES

4.1 Description of first aid measures

General information:

Do not leave affected persons unattended. Personal protection for the First Aider. Involve doctor immediately. Immediately remove any clothing soiled by the product. In case of irregular breathing or respiratory arrest provide artificial respiration. Provide oxygen treatment if affected person has difficulty breathing.

After Inhalation:

Take affected persons into fresh air and keep quiet. Supply fresh air. Call a doctor immediately.

After Skin Contact:

Immediately wash with water and soap and rinse thoroughly. Call a doctor immediately.

After Eye Contact:

Rinse opened eye for several minutes under running water. Call a doctor immediately.

After Swallowing:

Rinse out mouth and then drink plenty of water. Do not induce vomiting; call for medical help immediately. NOTE: Never give an unconscious person anything to drink.

4.2 Most important symptoms and effects, both acute and delayed

Causes severe skin burns and eye damage. Gastric or intestinal disorders

4.3 Indication of any immediate medical attention and special treatment needed

Medical supervision for at least 48 hours.

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media:

The product is not flammable
Use fire extinguishing methods suitable to surrounding conditions
CO2, powder or water spray. Fight larger fires with water spray or alcohol resistant foam

For safety reasons unsuitable extinguishing agents: Water with full jet

Special hazards causes by the substance, its products of combustion or resulting gases:

In case of fire, the following can be released: Phosphorus oxides (e.g. P205)

Protective equipment:

Wear self contained respiratory protection. Wear fully protective suit

Additional information

Cool endangered receptacles with water spray. Collect contaminated fire fighting water separately. It must not enter the sewage system.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures:

Wear protective equipment. Keep unprotected persons away
Mount respiratory protective device

6.2 Environmental precautions: Dilute with plenty of water
Do not allow to enter sewers/surface or ground water

6.3 Methods and material for containment and cleaning up:

Absorb with liquid binding material

Use neutralising agent
Dispose contaminated materials as waste according to item 13
Ensure adequate ventilation
6.4 Reference to other sections See Section 8 for information on personal protection equipment.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Keep receptacles tightly sealed. Ensure good ventilation/exhaustion at the workplace. When diluting always pour product into water and not vice versa
Information about fire – and explosion protection: No special measures required
7.2 Conditions for safe storage, including any incompatibilities
Requirements to be met by storerooms and receptacles:
Store only in the original receptacle. Use polyolefine receptacles. Provide acid-resistant floor. Suitable material for receptacles and pipes: Stainless steel.
Information about storage in one common storage facility:
Store away from reducing agents. Store away from metals. Do not store together with alkalis (caustic solutions)
Further information about storage conditions: Keep container tightly sealed
Recommended storage temperature:
Phosphoric acid, solution 93%: +35 - +42°C
85%: +28 - +42°C
80%: +15 - +42°C
<75%: no need in heating
(For other acid concentrations please use interpolation)
7.3 Specific end use(s) No further relevant information available.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Additional information about design of technical facilities: no further data: see item 7
Ingredients with limit values that require monitoring in the workplace:
7664-38-2 Orthophosphoric Acid

IOELV (EU)	Short-term value: 2 mg/m^3
	Long-term value: 1 mg/m^3
PEL (USA)	1 mg/m^3
REL (USA)	Short-term value: 3mg/m^3
	Long-term value: 1 mg/m^3
TLV (USA)	Short-term value: 3 mg/m^3
TLV (USA)	Long-term value: 1 mg/m^3
AGW (Germany)	Long-term value: 2 E mg/m³
	2(I);DFG, EU, AGS, Y

DNELs
For workers:
Long-term-local effects (inhalation) DNEL: 1 mg/m³
Acute local effects (inhalation) DNEL: 2 mg/m³
Long-term-systemic effects (inhalation) DNEL: 10.7 mg/m³
For general population:
Long-term-local effects (inhalation) DNEL: 0.36 mg/m³
Long-term-systemic effects (oral) DNEL: 4.57 mg/kg bw/day
PNECs
Not applicable
Phosphoric acid toxicity is related to its acidic nature. A generic PNEC (water) cannot be derived as the effects are highly depending on the pH of the receiving water and its buffer capacity highly variable**.**
8.2 Exposure controls
General protective and hygienic measures:
The usual precautionary measures are to be adhered to when handling chemicals. Do not eat or drink while working. Keep away from foodstuffs, beverages and feed. Immediately remove all soiled and contaminated clothing. Wash hands before breaks and at the end of work. Avoid contact with the eyes and skin.
Respiratory protection:
Use suitable respiratory protective device only when aerosol or mist is formed.
In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use self-contained respiratory protective device. Short term filter device: ABEK+P Filter A/P2 (EN 14387, EN 143)
Protection of hands: Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

Material of gloves

Butyl rubber, BR (0.7 mm)
Nitrile rubber, NBR (0.4 mm)
Chloroprene rubber, CR (0.5 mm)
Fluorocarbon rubber (Viton) (0.4 mm)
Natural rubber, NR (0.5 mm)
Neoprene gloves (0.5 mm)

Penetration time of glove material

≥8 h

Not suitable are gloves made of the following materials: Leather gloves

Eye protection:

Tightly sealed goggles (EN 166)

Body protection:

Acid resistant protective clothing. Boots

Limitation and supervision of exposure into the environment

Avoid discharging of phosphoric acid solutions into municipal wastewater, surface water or soils, when such discharges are expected to cause significant pH changes.

Risk management measures

Regular control of the pH value previous to or during discharges into open waters is required. Discharges should be carried out as to minimize pH changes in receiving surface waters. In general most aquatic organisms can tolerate pH values in the range of 6-9.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

General Information

Appearance:	Form: Solution
Colour:	Colourless
Odour:	Odourless
Odour threshold:	Not applicable
pH-value (23 g/l) at 20°C:	<1
Change in condition	
Melting point/Melting range:	-18 + 27°C (75-93% EC A.1)
Boiling point/Boiling range:	108 - 171°C (50-93%, 1013 hPa)
Flash point:	Not applicable. This product is inorganic substance.
Flammability (solid, gaseous):	Product is not flammable. (based on molecular structure)
Ignition temperature:	Not applicable
Decomposition temperature:	>200°C Thermal decomposition on losing water.
Self-igniting:	Product is not self igniting. (based on molecular structure)
Danger of explosion:	Product does not present an explosion hazard. (based on molecular structure)
Explosion limits:	None
Oxidizing properties	None. The substance does not contain any groups associated with oxidising properties.
Vapour pressure at 20°C:	4 Pa
Relative density at 20°C	1.574-1.791 (75-93%, EC A.3)
Vapour density	3.4 (air=1)
Evaporation rate	Not determined.
Solubility in / Miscibility with water at 20°C:	>1000 g/l
Segregation coefficient (n-octanol/water):	Not applicable. This substance is inorganic chemical.
Viscosity at 20°C:	1.1 - 600 mPa.s (5% - 105%)
9.2 Other information	No further relevant information available.

10. STABILITY AND REACTIVITY

10.1 Reactivity

Corrosive action on metals. Reacts with reducing agents. Reacts with alkali (lyes). Ammonia (NH_3), fluorine, sulphur trioxide (SO_3), phosphorus pentoxide (P_2O_5).

10.2 Chemical stability

No decomposition if used and stored according to specifications.

10.3 Possibility of hazardous reactions

Reacts with metals forming hydrogen. Reacts with alkali (lyes).

10.4 Conditions to avoid

To avoid thermal decomposition do not overheat.

10.5 Incompatible materials:

Alkalis. Metals

10.6 Hazardous decomposition products:

Phosphorus oxides (e.g. P_2O_5)

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity:

LD/LC50 values relevant for classification:

Oral LD50 300 <LD50 ≤2000 mg/kg (rat) (equivalent to OECD 423)

Specific symptoms in biological assay:

Phosphoric acid is classified as corrosive to the skin, therefore, no need to perform an acute dermal and an acute inhalative toxicity tests.

Primary irritant effect:

Skin corrosion/irritation:

Causes severe skin burns and eye damage.

Serious eye damage/irritation:

Causes severe skin burns and eye damage.

Respiratory or skin sensitisation

No sensitising effects known.

Phosphoric acid is classified as skin corrosive, thus a further assessment for sensitisation is not necessary.

Additional toxicological information:

Swallowing will lead to a strong caustic effect on mouth and throat and to the danger of perforation of oesophagus and stomach.

Toxicokinetics, metabolism and distribution

This substance is not considered to have bioaccumulative potential as it is highly soluble in water and phosphate levels in the body are regulated via homeostasis.

For risk assessment purposes oral absorption is considered to be 50-100%, inhalation absorption 100% and dermal absorption 50-100%.

Wide distribution throughout the body is to be expected and excretion will be predominantly via urine. Supporting studies show increased phosphorus retention in bone and increased urinary phosphorus excretion after prolonged dietary administration of phosphoric acid and support the initial toxicokinetic assessment.

CMR effects (carcinogenity, mutagenicity and toxicity for reproduction) Germ cell mutagenicity

None. (according to OECD 471, OECD 473, OECD 476 test(s))

Carcinogenicity:

No data available (no carcinogenicity study needs to be performed as this substance is not genotoxic)

Toxicity for reproduction:

No classification is necessary.

Reproductive toxicity: NOAEL≥500 mg/kg bw/day ; rat; oral (OECD 422) developmental toxicity: NOAEL≥410 mg/kg bw/day ; rat; oral

Maternal toxicity: NOAEL≥410 mg/kg bw/day ; rat; oral (equivalent to OECD 414)

STOT-single exposure

Based on available data, the classification criteria are not met.

STOT-repeated exposure

Based on available data, the classification criteria are not met.

7664-38-2 Orthophosphoric acid

Oral NOAEL 250 mg/kg bw/day (rat) (OECD 422 (sub chronic)) should not be classified for STOT - repeated exposure

Aspiration hazard

Based on available data, the classification criteria are not met.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Aquatic toxicity:

Phosphoric acid toxicity is related to its acidic nature and, therefore, is more related to concentration than to dose.
EC50/48 h (static) >100 mg/L (Daphnia magna) (OECD 202, freshwater)
EC50/72 h (static) >100 mg/L (algae) (OECD 201, freshwater)
median lethal pH 96h : 3-3.25 (Bluegill fish) fish mortality is caused by low pH values

12.2 Persistence and degradability

The substance is inorganic; therefore no biodegradation tests are applicable.
Phosphoric acid dissociates in water into H3O+, H2PO4–, HPO4- - ions, which cannot be further degraded.

Other information:

The product should not get in high quantities into waste water because it may act as a plant nutrient and cause eutrophication.

12.3 Bioaccumulative potential

Does not accumulate in organisms
This substance is highly water soluble and dissociating.
Phosphoric acid dissociates in water into H3O+, H2PO4–, HPO4- - ions, which are ubiquitous in the environment.
Phosphoric acid is absorbed in form of phosphate anions. This anion is an essential component of the body.

12.4 Mobility in soil

This substance is highly water soluble and dissociating.
When spilled onto soil, phosphoric acid will infiltrate downward and will be partially neutralized by dissolving some of the soil material. On reaching the ground table phosphoric acid will be dispersed and diluted. Therefore, the environmental assessment should be limited to the aquatic compartment.

Behaviour in sewage processing plants:

Phosphoric acid is of low toxicity to microorganisms, since in sewage treatment plants the microorganisms are essentially exposed to mainly H2PO4- and HPO4- - ions, which are an essential nutrient for them, and not to parent phosphoric acid or to low pH values.

12.5 Results of PBT and vPvB assessment

PBT: No assessment is required for inorganic substances.
vPvB: No assessment is required for inorganic substances.

12.6 Other adverse effects

Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
Rinse off bigger amounts into drains or the aquatic environment may lead to decreased pH-values. A low pH-value harms aquatic organisms. In the dilution of the use-level the pH-value is considerably increased, so that after the use of the product the aqueous waste, emptied into drains, is only low water-dangerous.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Recommendation

Must not be disposed together with household garbage. Do not allow product to reach sewage system.
Disposal must be made according to official regulations.
Small amounts may be diluted with plenty of water and washed away. Dispose of bigger amounts in accordance with Local Authority requirements.

European waste catalogue 06 01 04 phosphoric and phosphorous acid

Uncleaned packaging:

Recommendation:

Empty contaminated packagings thoroughly. They may be recycled after thorough and proper cleaning.
Packagings that may not be cleansed are to be disposed of in the same manner as the product. Disposal must be made in accordance with Local Authority requirements.

Recommended cleansing agents: Water, if necessary together with cleansing agents

14. TRANSPORT INFORMATION

DOT Regulations

Hazard class:	8
Identification number:	UN1805
Packing group:	III
Proper shipping name (technical name):	PHOSPHORIC ACID, SOLUTION
Label:	8

Continued

Land Transport ADR/RID (cross-border)

ADR/RID class:	8 (CI) Corrosive substances
Danger code (Kemler):	80
UN Number:	1805
Packaging group:	III
Hazard label:	8
Description of goods:	1805 PHOSPHORIC ACID, SOLUTION

Maritime transport IMDG:

IMDG class:	8
UN Number:	1805
Label:	8
Packaging group:	III
EMS Number:	F-A, S-B
Maritime pollutant:	No
Proper shipping name:	PHOSPHORIC ACID, SOLUTION

Air transport ICAO-TI and IATA-DGR:

ICAO/IATA Class:	8
UN/ID Number:	1805
Label:	8
Packaging group:	III
Proper shipping name:	PHOSPHORIC ACID, SOLUTION
UN 'Model Regulation':	UN1805, PHOSPHORIC ACID, SOLUTION, 8, III

Transport/Additional information:

ADR

Tunnel restriction code E

UN "Model Regulation": UN1805, PHOSPHORIC ACID, SOLUTION, 8, III

15. REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Directive 2000/60 EC (phosphates)

Labelling according to Regulation (EC) No 1272/2008

The substance is classified and labelled according to the CLP regulation.

National regulations:

Control of Explosive Precursors and Poisons Regulations 2023: This product is classified as a regulated explosive precursor.

Information about limitation of use: Employment restrictions concerning juveniles must be observed.

Other regulations, limitations and prohibitive regulations

Substances of very high concern (SVHC) according to REACH, Article 57 None

Registration status (Chemical Inventories listing) :

United States (TSCA) : listed China (IECSC) : listed
Canada (DSL) : listed
Australia (AICS) : listed
Japan (ENCS) : listed
Korea (KECI) : listed
Philippines (PICCS) : listed
NTP (National Toxicology Program) : Substance is not listed
IARC (International Agency for Research on Cancer)**:** Substance is not listed

15.2 Chemical safety assessment: A Chemical Safety Assessment has been carried out.

16. OTHER INFORMATION

Hazard statements

H290 May be corrosive to metals.
H302 Harmful if swallowed.
H314 Causes severe skin burns and eye damage.

Abbreviations and acronyms:

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
ICAO: International Civil Aviation Organization
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
DNEL: Derived No-Effect Level (REACH)
PNEC: Predicted No-Effect Concentration (REACH)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
NOAEL: No Observable Adverse Effect Level
STOT: Single Target Organ Toxicity
OECD: Organisation for Economic Co-operation and Development
RCR: Risk Characterisation Ratio
PRE: Personal Respiratory Equipment
LEV: Local Exhaust Ventilation

Modifications from last revision

Section 15 of this datasheet has been updated.

Revision Date: 15/09/2023