OSPHO METAL TREATMENT
SAFETY DATA SHEET

SECTION 1: Identification
1.1. Product identifier
Product form: SOLUTION/MIXTURE
Trade name: OSPHO
Chemical name: Orthophosphoric acid
CAS No: 7664-36-2
Product code: N/A
Formula: H3PO4
Synonyms: ORTHOPHOSPHORIC ACID
REACH registration No.: 01-2119485924-24-0021

1.2. Relevant identified uses of the substance or mixture and uses advised against
Use of the solution/mixture:
Metal surface treatment product

1.3. Details of the supplier of the safety data sheet
The Skybryte Company
3125 Perkins Avenue
Cleveland, Ohio 44114-4689
SDS Preparer: Stephen L. Pitcher
Date: SEPTEMBER 2, 2018

1.4. Emergency telephone number
In case of emergency: CHEMTREC 1-800-424-9300
For other countries, see section 16.6

SECTION 2: Hazards identification
2.1. Classification of the solution or mixture
GHS-US classification
Skin Corr. 1B H314
Full text of H-phrases: see section 16
VOC = 0%

2.2. Label elements
GHS-US labelling
Hazard pictograms (GHS-US) : 

<table>
<thead>
<tr>
<th>CORROSIVE</th>
<th>IRRITANT</th>
</tr>
</thead>
</table>

Signal word (GHS-US) : Danger
Hazard statements (GHS-US) : H314 - Causes severe skin burns and eye damage
Precautionary statements (GHS-US) : P260 - Do not breathe spray, mist, fume, gas, dust, vapours
P280 - Wear protective gloves, protective clothing, eye protection, face protection
P301+P330+P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting
P303+P361+P353 - IF ON SKIN (or hair): Remove/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
P234 - Keep only in original container
2.3. Other hazards
No additional information available
2.4. Unknown acute toxicity (GHS-US)
Not applicable

SECTION 3: Composition/Information on Ingredients

3.1. Substance
Name: Orthophosphoric Acid
CAS No: 7664-38-2

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
<th>GHS-US classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orthophosphoric acid</td>
<td>(CAS No) 7664-38-2</td>
<td>40% by weight</td>
<td>Skin Corr. 1B, H314</td>
</tr>
</tbody>
</table>

Full text of H-phrases: see section 16

3.2. Solution/mixture
Specific Gravity (H2O = 1) 1.22 +/- .04

SECTION 4: First-aid measures

4.1. Description of first-aid measures
First-aid measures after inhalation: Remove victim to fresh air. If persistent breathing troubles, immediately seek medical attention.
First-aid measures after skin contact: Rinse immediately with clean water for 20-30 minutes. Remove contaminated clothing and shoes. If on skin, take off contaminated clothing. Get medical advice/attention.
First-aid measures after eye contact: Get medical advice/attention. In case of eye contact, immediately rinse with clean water for 20-30 minutes.
First-aid measures after ingestion: If swallowed, rinse mouth with water (only if the person is conscious). Do not induce vomiting. Call a doctor.

4.2. Most important symptoms and effects, both acute and delayed
Symptoms/injuries: The vapour causes slight irritation in eyes, throat, and skin. Causes eye and skin burns,

4.3. Indication of any immediate medical attention and special treatment needed
See Heading 4.1. An endoscope or a stomach wash might be considered but might cause severe stomach or oesophagus damage.

SECTION 5: Firefighting measures

5.1. Extinguishing media
Unsuitable extinguishing media: Heavy water stream.

5.2. Special hazards arising from the substance or mixture
Fire hazard: Not flammable.
Reactivity: Contact with metals produces hydrogen which may form explosive mixtures with air. Reacts with strong bases.

5.3. Advice for firefighters
Firefighting instructions: Use water spray/fog for cooling.
Protection during firefighting: Wear complete protective anti-acid clothing, gloves and boots. Use self-contained breathing apparatus. SECTION 8.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
General measures: Spill should be handled by trained cleaning personnel properly equipped with respiratory and eye protection. Keep public away from danger area. Good ventilation of the workplace required. see section(s) 8.2.

6.1.1. For non-emergency personnel
No additional information available
6.1.2. For emergency responders
No additional information available
6.2. Environmental precautions
Prevent entry to sewers and surface waters. Prevent entry to sewers and soil.
6.3. Methods and material for containment and cleaning up

Methods for cleaning up: Clean up any spills as soon as possible, using an absorbent material to collect it. Transfer in an appropriate container properly labelled in order to set up a future treatment. Neutralize with sodium carbonate, calcium carbonate, or lime. Rinse with plenty of water.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling: Good ventilation of the workplace required. Use suitable material. Follow the exposure limits given on this material safety data sheet. For preference use pumping techniques for unloading and discharging. Waterproof retention basin. Avoid any direct contact with the product. Do not breathe vapours. Never introduce water or any aqueous agent into tanks or containers. Do not subject to Splatters. Always add the product to the water for dilution/mixture. Do not mix with incompatible materials (see section 10.5).

Hygiene measures: Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. When using do not eat, drink or smoke. Remove contaminated clothing and shoes.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions: Store in dry, cool, well-ventilated area. Do not store under direct sun light. Store at room temperature above crystallization point.

Incompatible products: Keep away from alkalies, sulfides, cyanides and metal powders.

Packaging materials: Stainless steel, glass, Polyethylene (high density).

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

<table>
<thead>
<tr>
<th>ACGIH</th>
<th>ACGIH TWA (mg/m³)</th>
<th>OSHA PEEL (TWA) (mg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACGIH</td>
<td>1 mg/m³ - 3mg/m³</td>
<td>1 mg/m³</td>
</tr>
</tbody>
</table>

8.2. Exposure controls

Appropriate engineering controls: Use in closed process (for example in close loop system). Good ventilation of the workplace required. Monitor the atmosphere at regular intervals. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

Hand protection: Wear chemical protective gloves.

Eye protection: Chemical goggles or face shield with safety glasses.

Skin and body protection: Wear acid-resistant protective clothing. Wear impervious rubber safety shoes.

Respiratory protection: Vapours or aerosols: Respiratory protection programs must comply with 29 CFR 1910.134. Use only outdoors or in a well-ventilated area.

Environmental exposure controls: For preference use pumping techniques for unloading and discharging.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state: Liquid

Appearance: Slightly viscous liquid

Molecular mass: 98 g/mol

Colour: green

Odour: Acid

Odour threshold: No data available

pH: < 1.5

Relative evaporation rate (butylacetate=1): No data available

Melting point: 36%: -17°C  85%: +21.1°C

Freezing point: No data available

Boiling point: 36%: 104°C  85%: 154°C
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Flash point : Not flammable
Auto-ignition temperature : No data available
Decomposition temperature : No data available
Flammability (solid, gas) : No data available
Vapour pressure : Not applicable
Relative vapour density at 20 °C : No data available
Relative density : No data available
Density : (20°C) 36%: 1.225 ; 85%: 1.689
Solubility : Water: 100 %
Log Pow : No data available
Log Kow : No data available
Viscosity, kinematic : (25°C) 85%: 23°C
Viscosity, dynamic : No data available
Explosive properties : No data available
Oxidising properties : No data available
Explosive limits : No data available

9.2. Other information
No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity
Contact with metals produces hydrogen which may form explosive mixtures with air. Reacts with strong bases.

10.2. Chemical stability
Stable under normal conditions (Handling and storage).

10.3. Possibility of hazardous reactions
No additional information available

10.4. Conditions to avoid
Heat. Light (daylight).

10.5. Incompatible materials

10.6. Hazardous decomposition products
May liberate toxic gases.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

<table>
<thead>
<tr>
<th>OSPHO (7664-38-2)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LD50 oral rat</td>
<td>2600 mg/kg bodyweight Similar to:OECD 423</td>
</tr>
<tr>
<td>LD50 dermal rat</td>
<td>No data available</td>
</tr>
<tr>
<td>LC50 inhalation rat (mg/l)</td>
<td>No data available</td>
</tr>
</tbody>
</table>

Skin corrosion/irritation : Causes severe skin burns and eye damage.
  pH: < 1.5

Serious eye damage/irritation : Not classified
  (Irritating to eyes.)
  pH: < 1.5

Respiratory or skin sensitisation : Not classified
  (Not relevant. Corrosive product)

Germ cell mutagenicity : Not classified
Carcinogenicity : Not classified
  (No data available.)

Reproductive toxicity : Not classified
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Specific target organ toxicity (single exposure) : Not classified
Specific target organ toxicity (repeated exposure) : Not classified

<table>
<thead>
<tr>
<th>Substance</th>
<th>Effect</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSPHO</td>
<td>LC50 fishes 1</td>
<td>(3 - 3.25 mg/l (8h) Leptota macrochinus)</td>
</tr>
<tr>
<td></td>
<td>EC50 Daphnia 1</td>
<td>&gt; 100 mg/l (48 - Daphnia magna, OECD 202)</td>
</tr>
<tr>
<td></td>
<td>ErC50 (algae)</td>
<td>&gt; 100 mg/l (72 - Desmodesmus subsipicatus, OECD 201)</td>
</tr>
<tr>
<td></td>
<td>NOEC (acute)</td>
<td>100 mg/l (72 - Desmodesmus subsipicatus, OECD 201)</td>
</tr>
</tbody>
</table>

Aspiration hazard : Not classified

SECTION 12: Ecological information

12.1. Toxicity

<table>
<thead>
<tr>
<th>Substance</th>
<th>Effect</th>
<th>Value</th>
</tr>
</thead>
<tbody>
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</tr>
<tr>
<td></td>
<td>NOEC (acute)</td>
<td>100 mg/l (72 - Desmodesmus subsipicatus, OECD 201)</td>
</tr>
</tbody>
</table>

12.2. Persistence and degradability

<table>
<thead>
<tr>
<th>Substance</th>
<th>Effect</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSPHO</td>
<td>Persistence and degradability</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

12.3. Bioaccumulative potential

<table>
<thead>
<tr>
<th>Substance</th>
<th>Effect</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSPHO</td>
<td>Bioaccumulative potential</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

12.4. Mobility in soil

<table>
<thead>
<tr>
<th>Substance</th>
<th>Effect</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSPHO</td>
<td>Ecology - soil</td>
<td>No data available</td>
</tr>
</tbody>
</table>

12.5. Other adverse effects

Effect on ozone layer : 
Effect on the global warming : No known ecological damage caused by this product.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods : Neutralize with sodium carbonate, calcium carbonate, or lime. When totally empty, containers are recyclable like any other packing. Storage containers must be free of contamination before use.

Waste disposal recommendations : This material when discarded in pure form is not a hazardous waste as defined by 40 CFR 261, the Resource Conservation and Recovery Act (RCRA). Dry materials may be landfilled or recycled in accordance with local, state, and federal regulations. If materials have become contaminated with other substances, dispose of in accordance with local, state, and federal regulations.

SECTION 14: Transport information

In accordance with DOT

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN-No.(DOT)</td>
<td>UN1805</td>
</tr>
<tr>
<td>Proper Shipping Name (DOT)</td>
<td>PHOSPHORIC ACID, SOLUTION</td>
</tr>
<tr>
<td>Department of Transportation (DOT) Hazard Classes</td>
<td>8 - Class 8 - Corrosive material 49 CFR 173.136</td>
</tr>
<tr>
<td>Hazard labels (DOT)</td>
<td>8 - Corrosive</td>
</tr>
</tbody>
</table>

Packing group (DOT) : III - Minor Danger
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DOT Special Provisions (49 CFR 172.102) : A7 - Steel packagings must be corrosion-resistant or have protection against corrosion.
IB3 - Authorized IBCs: Metal (31A, 31B and 31N); Rigid plastics (31H1 and 31H2); Composite (31H21 and 31HA2, 31HB2, 31HN2, 31HD2 and 31HH2). Additional Requirement: Only liquids with a vapor pressure less than or equal to 110 kPa at 50°C (1.1 bar at 122°F), or 130 kPa at 55°C (1.3 bar at 131°F) are authorized, except for UN2672 (also see Special Provision IP8 in Table 2 for UN2672).
N34 - Aluminum construction materials are not authorized for any part of a packaging which is normally in contact with the hazardous material.
T4 - 2.65 178.274(d)(2) Normal............... 178.275(d)(3)
TP1 - The maximum degree of filling must not exceed the degree of filling determined by the following: Degree of filling = 97 / (1 + a (tr - tf)) Where: tr is the maximum mean bulk temperature during transport, and tf is the temperature in degrees Celsius of the liquid during filling.

DOT Packaging Exceptions (49 CFR 173.xxx) : 154
DOT Packaging Non Bulk (49 CFR 173.xxx) : 203
DOT Packaging Bulk (49 CFR 173.xxx) : 241
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : 5 L
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 60 L
DOT Vessel Stowage Location : A - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel.

Additional information : No supplementary information available.

ADR
Transport document description : UN 1805 PHOSPHORIC ACID, LIQUID, 8, III, (E)
Packing group (ADR) : III
Class (ADR) : 8 - Corrosive substances
Hazard identification number (Kemler No.) : 80
Classification code (ADR) : C1
Danger labels (ADR) : 8 - Corrosive substances

Orange plates

Tunnel restriction code (ADR) : E
Excepted quantities (ADR) : E1

Transport by sea
UN-No. (IMDG) : 1805
Class (IMDG) : 8 - Corrosive substances
Packing group (IMDG) : III - substances presenting low danger
MFAG-No : 154

Air transport
UN-No.(IATA) : 1805
Class (IATA) : 8 - Corrosives

Civil Aeronautics Law : Corrosive substances(Hazardous materials notice Appendix Table 1 Article 194 of the Enforcement Regulations)
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SECTION 15: Regulatory Information

15.1. US Federal regulations

<table>
<thead>
<tr>
<th>OSPHO (7664-38-2)</th>
<th>Listed on the United States TSCA (Toxic Substances Control Act) Inventory</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>SARA Section 302 Threshold Planning Quantity (TPQ)</td>
<td>Immediate (acute) health hazard</td>
<td></td>
</tr>
<tr>
<td>SARA Section 311/312 Hazard Classes</td>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td>SARA Section 313 - Emission Reporting</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

All components of this product are listed, or excluded from listing, on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory except for:

| Acide orthophosphorique | CAS No 7664-38-2 | 80.00% |

This product or mixture does not contain a toxic chemical or chemicals in excess of the applicable de minimis concentration as specified in 40 CFR §372.38(a) subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

15.2. International regulations

CANADA

<table>
<thead>
<tr>
<th>OSPHO (7664-38-2)</th>
<th>Listed on the Canadian NDSL (Non-Domestic Substances List)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHMIS Classification</td>
<td>Class E - Corrosive Material</td>
</tr>
</tbody>
</table>

EU-Regulations
No additional information available

Classification according to Regulation (EC) No. 1272/2008 [CLP]
Skin Corr. 1B - H314
Full text of H-phrases: see section 16

Classification according to Directive 67/548/EEC [DSD] or 1999/45/EC [DPD]
Not classified

15.2. National regulations

<table>
<thead>
<tr>
<th>OSPHO (7664-38-2)</th>
<th>CERCLA reportable quantities: 5,000lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ANSI/NSF Std. 60 – potable water systems: Certified</td>
</tr>
<tr>
<td></td>
<td>US Food &amp; Drug Admin: Recognized as Generally Recognized</td>
</tr>
<tr>
<td></td>
<td>Hazardous chemical under the criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200), Appendix A: Corrosive</td>
</tr>
</tbody>
</table>

15.3. US State regulations

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer and/or reproductive harm

SECTION 16: Other information

Revision date: SEPTEMBER 2, 2018
Data sources: Reach dossier.
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Abbreviations and acronyms
ADN: European Agreement concerning international carriage of Dangerous goods by Inland waterways
ADR: European Agreement concerning international carriage of Dangerous goods by Road
AF: Assessment factor
BCF: Bioconcentration factor
Bw: Body weight
CAS: Chemical Abstracts Service
CLP: Classification, labelling, packaging
CSR: Chemical Safety Report
DMEL: Derived maximum effect level
DNEL: Derived No effect Level
EC: European Community
ELV: Emission limit values
EN: European Norm
EUH: European Hazard Statement
EWC: European Waste catalogue
IATA: International Air Transport Association
ICAO: International Civil Aviation Organization
IMDG: International Maritime Dangerous Goods
LC50: Median lethal concentration
LD50: Median lethal dose
NOAEL: No observed adverse effect level
NOEC: No observed effect concentration
NOEL: No observed effect level
OEL: Operator exposure level
PBT: Persistent, bioaccumulative, Toxic
PEC: Predicted effect level
PNEC: Predicted No effect Concentration
REACH: Registration, evaluation and authorisation of chemicals
RID: Regulations concerning the international carriage of dangerous goods by rail
STEL: Short Term Exposure Limit
TWA: Time weighted average
vPvB: Very persistent, very bioaccumulative.
VOC: Volatile organic compound

Full text of H-phrases:

| H314 | Skin corrosion/irritation, Category 1B | Causes severe skin burns and eye damage |

NFPA health hazard:
2 - Intense or continued but not chronic exposure could cause temporary incapacitation or possible residual injury.

NFPA fire hazard:
0 - Materials that will not burn.

NFPA reactivity:
0 - Normally stable, even under fire exposure conditions, and are not reactive with water.

SDS US (GHS HazCom 2012)

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HMIS

HEALTH
0

FLAMMABILITY
2

REACTION
0

PERSONAL PROTECTION
H

HMIS