Section 1: CHEMICAL PRODUCT & COMPANY IDENTIFICATION

Product Name: Triphenyl Phosphate

Application: Used as noncombustible substitute for camphor in celluloid; Used in rendering acetyl cellulose, nitrocellulose, airplane "dope", stable and fireproof; impregnating roofing paper; plasticizer in lacquers and varnishes.

Supplier: Focus Chemical Inc.
25000 Country Club Blvd. STE 444
North Olmsted, OH 44070 USA
Tel: 866-801-1201
Email: Requests@focuschemical.com

Emergency No.: 866-801-1201
24 Hrs. Emergency name & No.: CHEMTREC # 800-424-9300

Section 2: HAZARDS IDENTIFICATION

- Classification of the substance or mixture
- Classification according to Regulation (EC) No 1272/2008

GHS09 environment

Aquatic Acute 1   H400 Very toxic to aquatic life.
Aquatic Chronic 1  H410 Very toxic to aquatic life with long lasting effects.

- Classification according to Directive 67/548/EEC or Directive 1999/45/EC

T; Toxic
R25: Toxic if swallowed
N; Dangerous for the environment

R50/53: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

- Information concerning particular hazards for human and environment: Not applicable.

- Label elements
- Labelling according to Regulation (EC) No 1272/2008
- Hazard pictograms

GHS0
- **Signal word**: Warning
- **Hazard-determining components of labelling**: Void
- **Hazard statements**
  H400 Very toxic to aquatic life.
  H410 Very toxic to aquatic life with long lasting effects.
- **Precautionary statements**
  P273 Avoid release to the environment.
  P391 Collect spillage.
  P501 Dispose of contents/container in accordance with local/regional/national/international regulations.
- **Labelling according to EU guidelines**: The product has been classified and marked in accordance with EU Directives / Ordinance on Hazardous Materials.
- **Code letter and hazard designation of product**:
  
  ![Skeletor](image)
  
  T Toxic
  N Dangerous for the environment

- **Risk phrases**:
  25 Toxic if swallowed.
  50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

- **Safety phrases**:
  45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

**Section 3: COMPOSITION/INFORMATION ON INGREDIENTS**

- **Chemical characterization**:
- **CAS No. Description**
  115-86-6 triphenyl phosphate
- **Identification number(s)**
- **EINECS Number**: 204-112-2
- **Additional information**:
  Molecular Formula: C18-H15-O4-P
  Molecular Weight: 326.28

**Section 4: FIRST AID MEASURES**

- **General information**:
  Immediately remove any clothing soiled by the product.
  In case of irregular breathing or respiratory arrest provide artificial respiration.
- **After inhalation**: In case of unconsciousness place patient stably in side position for transportation.
- **After skin contact**: Immediately wash with water and soap and rinse thoroughly.
- **After eye contact**: Rinse opened eye for several minutes under running water. Then consult a doctor.
- **After swallowing**: Do not induce vomiting; call for medical help immediately.
- **Information for doctor**: Treat symptomatically and supportively.
Section 5: FIRE FIGHTING MEASURES

- Suitable extinguishing agents: Use fire extinguishing methods suitable to surrounding conditions.
- Special hazards caused by the substance, its products of combustion or resulting gases: Toxic gases and vapors such as phosphoric acid fume and carbon monoxide may be released.
- Protective equipment: Wear self-contained respiratory protective device.

Section 6: ACCIDENTAL RELEASE MEASURES

- Person-related safety precautions: Wear protective equipment. Keep unprotected persons away.
- Measures for environmental protection: Inform respective authorities in case of seepage into water course or sewage system. Do not allow to enter sewers/surface or ground water.
- Measures for cleaning/collection: Dispose contaminated material as waste according to item 13.
- Additional information: Refer to section 8 and 13 for additional information on personal protection equipment and disposal methods.

Section 7: HANDLING AND STORAGE

- Handling:
  - Information for safe handling: Store in cool, dry place in tightly closed receptacles.
  - Information about fire - and explosion protection: Keep respiratory protective device available. Protect against electrostatic charges. Keep ignition sources away. Do not smoke.
- Storage:
  - Requirements to be met by storerooms and receptacles: Store away from acids and strong oxidizing agents.
  - Information about storage in one common storage facility: Do not store together with incompatible materials and foodstuffs.
  - Further information about storage conditions: Protect from exposure to the light. Store in cool, dry conditions in well-sealed receptacles.
- Specific applications
  Used as noncombustible substitute for camphor in celluloid; used in rendering acetylcellulose, nitrocellulose, airplane "dope", stable and fireproof; impregnating roofing paper; plasticizer in lacquers and varnishes.

Section 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 at the workplace: Not required.
- Personal protective equipment:
  - General protective and hygienic measures: Keep away from foodstuffs, beverages and feed. Immediately remove all soiled and contaminated clothing. Wash hands before breaks and at the end of work.
  - Respiratory protection: Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multipurpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate
government standards such as NIOSH (US) or CEN (EU).

- **Protection of hands:**

  **Protective gloves**
  
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
  
  Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
  
  Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

- **Material of gloves**
  
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

- **Penetration time of glove material**
  
The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

- **Eye protection:**

  **Tightly sealed goggles**

- **Body protection:** Protective work clothing

<table>
<thead>
<tr>
<th><strong>Section 9: PHYSICAL AND CHEMICAL PROPERTIES</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance : White flakes</td>
</tr>
<tr>
<td>Boiling point : 193.5 degrees C at 0.1 mmHg</td>
</tr>
<tr>
<td>Color : White</td>
</tr>
<tr>
<td>Decomposition Temperature : &gt; 250 Degrees C</td>
</tr>
<tr>
<td>Percent Volatile : 0</td>
</tr>
<tr>
<td>Physical State : solid</td>
</tr>
<tr>
<td>Reactivity in water : Not reactive</td>
</tr>
<tr>
<td>Melting point : 49.4 Deg C (120 degrees F)</td>
</tr>
<tr>
<td>Molecular / chemical Formula : C₁₈H₁₅O₄P</td>
</tr>
<tr>
<td>Molecular Weight : 326.3</td>
</tr>
<tr>
<td>Octanol / water partition coefficient : log Kow = 4.59</td>
</tr>
<tr>
<td>Odor : Slightly aromatic odour resembling phenol</td>
</tr>
<tr>
<td>Solubility in water : 0.19 mg/100 mg at 25 Degrees C</td>
</tr>
<tr>
<td>Specific gravity or density : 0.96 g/cc (Water = 1)</td>
</tr>
<tr>
<td>Vapor Density : 1.268/60°C g/cm³</td>
</tr>
<tr>
<td>Vapor Pressure : 0.1 mmHg at 193.5 degrees C</td>
</tr>
<tr>
<td>Additional Information : The Henry's Law constant: 4X10⁻⁸ atm-cu m/mole</td>
</tr>
<tr>
<td>Solubility: Soluble Carbon tetrachloride, acquires, solvents, thinners, oils, alcohol, benzene, ether, chloroform and acetone</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Section 10: STABILITY AND REACTIVITY</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal decomposition / conditions to be avoided: Keep away from heat, air and moisture.</td>
</tr>
</tbody>
</table>
- **Materials to be avoided**: Avoid contact with strong oxidizing agents and alkalis.
- **Dangerous reactions** Reacts with acids, alkalis and oxidizing agents.
- **Dangerous decomposition products**:
  Toxic gases and vapors such as phosphoric acid fume and carbon monoxide may be released.

### Section 11: TOXICOLOGICAL INFORMATION

<table>
<thead>
<tr>
<th>Value (LD50/LC50)</th>
<th>Animal</th>
<th>Routes</th>
<th>Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>4200 mg/m³</td>
<td>Mammal</td>
<td>Acute inhalation</td>
<td>Triphenyl phosphate</td>
</tr>
<tr>
<td>1320 mg/kg</td>
<td>Mouse</td>
<td>Acute Oral</td>
<td>Triphenyl phosphate</td>
</tr>
<tr>
<td>&gt; 7900 mg/kg</td>
<td>Rabbit</td>
<td>Acute Dermal</td>
<td>Triphenyl phosphate</td>
</tr>
<tr>
<td>&gt; 200 mg/L</td>
<td>Rat</td>
<td>Acute Inhalation</td>
<td>Triphenyl phosphate</td>
</tr>
<tr>
<td>&gt; 2000 mg/kg</td>
<td>Rat</td>
<td>Acute Oral</td>
<td>Triphenyl phosphate</td>
</tr>
</tbody>
</table>

- **Primary irritant effect**:
  - **on the skin**: May cause mild skin irritation.
  - **on the eye**: May cause mild eye irritation.
  - **Sensitization**: No sensitizing effects known.
- **Subacute to chronic toxicity**:
  Causes a delayed peripheral neuritis involving motor neurons, resulting in a flaccid paralysis, particularly of the distal muscles.
- **CMR effects (carcinogenity, mutagenicity and toxicity for reproduction)**
  Mutagenicity: The substance was found to be non-mutagenic as per Ames test.

### Section 12: ECOLOGICAL INFORMATION

- **Information about elimination (persistence and degradability)**:
  The rate constant for the vapor-phase reaction of triphenyl phosphate with photochemically-produced hydroxyl radicals has been estimated as 1.09X10⁻¹¹ cu cm/molecule-sec at 25 deg C using a structure estimation method. This corresponds to an atmospheric half-life of about 35 hours at an atmospheric concentration of 5X10⁻⁵ hydroxyl radicals per cu cm.
- **Behavior in environmental systems**:
  - **Mobility and bioaccumulation potential**:
    Soil Adsorption/Mobility:
    The Koc of triphenyl phosphate was measured as 2,514, 3,561 and 2,756 in a silty clay, loamy sand and silt loam, respectively. According to a classification scheme, this range of Koc values suggests that triphenyl phosphate is expected to have slight mobility in soil.

  Environmental Bio concentration:
  A bio concentration factor for triphenyl phosphate of 250 was measured in killifish under static conditions and a BCF of 155 was measured in killifish in a flow through system. A BCF for triphenyl phosphate of 110 was observed in goldfish under static conditions.
- **Ecological effects**:
  - **Aquatic toxicity**:
    | LC50 (96 hrs) | Animal                  | Concentration           |
    |---------------|-------------------------|-------------------------|
    | 290 mg/l      | Leptomis Macrochirus    |                         |
    | 0.87 mg/l     | Pimephales Promelas     | Fathead Minnow          |
    | 95 mg/l       | Menidia beryllina       |                         |
  - **Remark**: Very toxic for fish
  - **Additional ecological information**: None
  - **General notes**:
    Water hazard class 2 (German Regulation) (Assessment by list): hazardous for water
Do not allow product to reach ground water, water course or sewage system. Danger to drinking water if even small quantities leak into the ground. Also poisonous for fish and plankton in water bodies. Very toxic for aquatic organisms.

Section 13: DISPOSAL INFORMATION

- **Product:**
  - **Recommendation:** Must not be disposed together with household garbage. Do not allow product to reach sewage system.

- **Uncleaned packaging:**
  - **Recommendation:**
    - Disposal must be made according to official regulations.
    - If triphenyl phosphate is spilled: ventilate area of spill. For small quantities, sweep onto paper or other suitable material, place in appropriate container and burn in a safe place (such as a fume hood). Large quantities may be reclaimed; however, if this is not practical, dissolve in a flammable solvent (such as alcohol) and atomize in a suitable combustion chamber equipped with an appropriate effluent gas cleaning device.

Section 14: TRANSPORTATION INFORMATION

**US Dot**

<table>
<thead>
<tr>
<th>Proper Shipping Name</th>
<th>Environmentally hazardous substances, solid, N.O.S. (Triphenyl phosphate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazard Class</td>
<td>9</td>
</tr>
<tr>
<td>ID Number</td>
<td>UN 3077</td>
</tr>
<tr>
<td>Packing Group</td>
<td>III</td>
</tr>
<tr>
<td>Special Provisions</td>
<td>8, B54, IB8, N20</td>
</tr>
<tr>
<td>Non-Bulk packaging</td>
<td>213</td>
</tr>
<tr>
<td>Passenger air/rail limit</td>
<td>No limit</td>
</tr>
<tr>
<td>Vessel stowage</td>
<td>A</td>
</tr>
<tr>
<td>Reportable quantity</td>
<td>N/A</td>
</tr>
<tr>
<td>Labels</td>
<td>Miscellaneous, marine pollutant</td>
</tr>
<tr>
<td>Packing Exceptions</td>
<td>155</td>
</tr>
<tr>
<td>Bulk Packing</td>
<td>240</td>
</tr>
<tr>
<td>Air cargo limit</td>
<td>No limit</td>
</tr>
<tr>
<td>Other stowage</td>
<td>N.A.</td>
</tr>
</tbody>
</table>

**AIR – ICAO OR IATA**

<table>
<thead>
<tr>
<th>Proper shipping name</th>
<th>Environmentally hazardous substances, solid, N.O.S. (Triphenyl phosphate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazard Class</td>
<td>9</td>
</tr>
<tr>
<td>ID Number</td>
<td>UN 3077</td>
</tr>
<tr>
<td>Subsidiary Risk</td>
<td>N/A</td>
</tr>
<tr>
<td>Packing Group</td>
<td>III</td>
</tr>
<tr>
<td>Hazard Labels</td>
<td>Miscellaneous, marine pollutant</td>
</tr>
<tr>
<td>Packing instructions</td>
<td>911</td>
</tr>
<tr>
<td>Air passenger limit per package</td>
<td>No limit</td>
</tr>
<tr>
<td>Packing instruction cargo</td>
<td>911</td>
</tr>
</tbody>
</table>
Air cargo limit per package | No limit  
---|---  
Special provisions | N/A  

### WATER – IMDG

| Proper Shipping name | Environmentally hazardous substance, solid, N.O.S. (Triphenyl phosphate)  
|---|---  
| Hazard Class | 9  
| ID Number | UN 3077  
| Packing Group | III  
| Subsidiary Risk | N/A  
| Medical first aid guide code | None  

Additional Information: Marine Pollutant  
EMS Number: None  

### Section 15: REGULATORY INFORMATION

- Labelling according to Regulation (EC) No 1272/2008  
- Hazard pictograms Please refer section 2  
- Signal word Warning  
- Hazard statements Please refer section 2  
- Precautionary statements Please refer section 2  
- Labelling according to EU guidelines:  
  - Risk phrases: Please refer section 2  
  - Safety phrases: Please refer section 2  
  - Chemical safety assessment A Chemical Safety Assessment has not been carried out.  
- National regulations:  
- Other regulations, limitations and prohibitive regulations  
- Substances of very high concern (SVHC) according to REACH, Article 57  
  The substance is not listed as SVHC.  

### Section 16: OTHER INFORMATION

Although the information and recommendations set forth herein are presented in good faith and believed to be correct as of the date hereof, Allison Group Inc. makes no representations as to be completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving the same will make their own determination as to its suitability for their purposes prior to use. In no event will Allison Group Inc. be responsible for damages of any nature whatsoever resulting from the use of or reliance upon information. No representations or warranties, either express or implied, of merchantability, fitness for a particular purpose or of any other nature are make hereunder with respect to information or the product to which information refers.