

# Material Safety Data Sheet

HAZARD WARNINGS		RISK PHRASES	PROTECTIVE CLOTHING
			   
		Toxic compound, do not ingest or inhale. Avoid all contact with this material. Irritating to skin, eyes, and the respiratory system. CARCINOGEN. MINIMIZE EXPOSURE.	

Section I. Chemical Product and Company Identification			
Chemical Name	<b>Tris(2-ethylhexyl) Phosphate</b>		
Catalog Number	P1022	Supplier	TCI America 9211 N. Harborgate St. Portland OR 1-800-423-8616
Synonym	Phosphoric acid, tris(2-ethylhexyl) ester (CA INDEX NAME); Phosphoric Acid Trioctyl Ester; Phosphoric Acid Tris(2-ethylhexyl) Ester; Trioctyl Phosphate		
Chemical Formula	C <sub>24</sub> H <sub>51</sub> O <sub>4</sub> P		
CAS Number	78-42-2	In case of Emergency Call	<b>Chemtrec®</b> <b>(800) 424-9300 (U.S.)</b> <b>(703) 527-3887 (International)</b>

Section II. Composition and Information on Ingredients				
Chemical Name	CAS Number	Percent (%)	TLV/PEL	Toxicology Data
Tris(2-ethylhexyl) Phosphate	78-42-2	Min. 98.0 (GC)	This chemical is classified as a carcinogen. There is no acceptable exposure limit for a carcinogen.	Rat LD <sub>50</sub> (oral) 37 gm/kg Rabbit LD <sub>50</sub> (dermal) 20 gm/kg Guinea Pig LD <sub>50</sub> (inhalation) 450 mg/m <sup>3</sup> /30M

Section III. Hazards Identification	
Acute Health Effects	Toxic if ingested or inhaled. Avoid prolonged contact with this material. Overexposure may result in serious illness or death. Irritating to eyes and skin on contact. Inhalation causes irritation of the lungs and respiratory system. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.
Chronic Health Effects	<b>CARCINOGENIC EFFECTS</b> : Carcinogenic by RTECS criteria. <b>MUTAGENIC EFFECTS</b> : Not available. <b>TERATOGENIC EFFECTS</b> : Tumorigenic effects. Rat TDLo Oral 1030000 mg/kg for 103 weeks intermittent TOXIC EFFECTS: Tumorigenic - Neoplastic by RTECS criteria Endocrine - Adrenal cortex tumors Mouse TDLo Oral 520 gm/kg for 2 years intermittent TOXIC EFFECTS: Tumorigenic - Carcinogenic by RTECS criteria Liver - Tumors Mouse TDLo Oral 257500 mg/kg for 103 weeks intermittent TOXIC EFFECTS: Tumorigenic - Neoplastic by RTECS criteria Endocrine - Thyroid tumors <b>DEVELOPMENTAL TOXICITY</b> : Not available. Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section IV. First Aid Measures	
Eye Contact	Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.
Skin Contact	In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.
Inhalation	If the victim is not breathing, perform mouth-to-mouth resuscitation. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, oxygen can be administered. Seek medical attention if respiration problems do not improve.
Ingestion	INDUCE VOMITING by sticking finger in throat. Lower the head so that the vomit will not reenter the mouth and throat. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive.

**Section V. Fire and Explosion Data**

Flammability	May be combustible at high temperature.	Auto-Ignition	370 °C (698 °F)
Flash Points	204 °C (399.2 °F)	Flammable Limits	Not available.
Combustion Products	These products are toxic carbon oxides (CO, CO <sub>2</sub> ), phosphates.		
Fire Hazards	Not available.		
Explosion Hazards	Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.		
Fire Fighting Media and Instructions	SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. DO NOT use water jet. Consult with local fire authorities before attempting large scale fire-fighting operations.		

**Section VI. Accidental Release Measures**

Spill Cleanup Instructions	Toxic material. Irritating material. Carcinogenic material. Stop leak if without risk. DO NOT get water inside container. DO NOT touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all sources of ignition. Consult federal, state, and/or local authorities for assistance on disposal.
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**Section VII. Handling and Storage**

Handling and Storage Information	TOXIC. IRRITANT. CARCINOGEN. Keep locked up. Keep away from heat. Mechanical exhaust required. When not in use, tightly seal the container and store in a dry, cool place. Avoid excessive heat and light. DO NOT ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. If ingested, seek medical advice immediately and show the container or the label. Treat symptomatically and supportively. Always store away from incompatible compounds such as oxidizing agents.
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**Section VIII. Exposure Controls/Personal Protection**

Engineering Controls	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash station and safety shower is proximal to the work-station location.
Personal Protection	Splash goggles. Lab coat. Vapor respirator. Boots. Gloves. A MSHA/NIOSH approved respirator must be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.
	
Exposure Limits	This chemical is classified as a carcinogen. There is no acceptable exposure limit for a carcinogen.

**Section IX. Physical and Chemical Properties**

Physical state @ 20°C	Liquid. (Clear, colorless.)	Solubility	Soluble in alcohol, ether, acetone. Insoluble in water (0.6 mg/L 24 °C).
Specific Gravity	0.93 (water=1)		
Molecular Weight	434.63	Partition Coefficient	LOG P <sub>ow</sub> : 4.23
Boiling Point	215 °C (419 °F) @ 4 mmHg	Vapor Pressure	1.1 x 10 <sup>-5</sup> Pa (@ 25 °C)
Melting Point	-74 °C (-101.2 °F)	Vapor Density	15 (Air = 1)
Refractive Index	1.44	Volatility	Not available.
Critical Temperature	Not available.	Odor	Odorless.
Viscosity	Not available.	Taste	Not available.

**Section X. Stability and Reactivity Data**

Stability	This material is stable if stored under proper conditions. (See Section VII for instructions)
Conditions of Instability	Avoid excessive heat and light.
Incompatibilities	Reactive with oxidizing agents.

**Section XI. Toxicological Information**

RTECS Number	MP0770000
Routes of Exposure	Eye Contact. Ingestion. Inhalation.
Toxicity Data	Rat LD <sub>50</sub> (oral) 37 gm/kg Rabbit LD <sub>50</sub> (dermal) 20 gm/kg Guinea Pig LD <sub>50</sub> (inhalation) 450 mg/m <sup>3</sup> /30M

Chronic Toxic Effects	<p><b>CARCINOGENIC EFFECTS</b> : Carcinogenic by RTECS criteria.  <b>MUTAGENIC EFFECTS</b> : Not available.  <b>TERATOGENIC EFFECTS</b> : Tumorigenic effects.  Rat TDLo Oral 1030000 mg/kg for 103 weeks intermittent  <b>TOXIC EFFECTS:</b>  Tumorigenic - Neoplastic by RTECS criteria  Endocrine - Adrenal cortex tumors  Mouse TDLo Oral 520 gm/kg for 2 years intermittent  <b>TOXIC EFFECTS:</b>  Tumorigenic - Carcinogenic by RTECS criteria  Liver - Tumors  Mouse TDLo Oral 257500 mg/kg for 103 weeks intermittent  <b>TOXIC EFFECTS:</b>  Tumorigenic - Neoplastic by RTECS criteria  Endocrine - Thyroid tumors  <b>DEVELOPMENTAL TOXICITY:</b> Not available.  Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.</p>
Acute Toxic Effects	<p>Toxic if ingested or inhaled. Avoid prolonged contact with this material. Overexposure may result in serious illness or death. Irritating to eyes and skin on contact. Inhalation causes irritation of the lungs and respiratory system. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.  Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.</p>

### Section XII. Ecological Information

Ecotoxicity	Not available.
Environmental Fate	<p>Trioctyl phosphate's production and use as a hydrogen peroxide production cosolvent and as a low-temperature plasticizer for PVC resins may result in its release to the environment. If released to the atmosphere, trioctyl phosphate is expected to exist almost entirely in the particulate phase in the ambient atmosphere based on a measured vapor pressure of 8.2X10<sup>-8</sup> mm Hg at 25 deg C. Particulate-phase trioctyl phosphate may be physically removed from the atmosphere by wet or dry deposition. If released to soil, an estimated Koc of 3.5X10<sup>+6</sup> suggests that trioctyl phosphate is expected to be immobile. Volatilization from wet and dry soil surfaces is not expected to occur based on an estimated Henry's Law constant of 7.9X10<sup>-8</sup> atm-cu m/mole at 25 deg C and the measured vapor pressure, respectively. The biodegradation of trioctyl phosphate in water suggests that biodegradation in soil may be important. If released into water, the estimated Koc for trioctyl phosphate suggests that this compound will adsorb strongly to suspended solids and sediment in the water column. Bioconcentration in aquatic organisms is expected to be low based on measured BCF values ranging from 2.4 to 22 in carp. Volatilization from water surfaces is not expected to be an important fate process given this compound's Henry's Law constant. Trioctyl phosphate biodegrades in river water with a rate of 26 to 75% over 30 days. Occupational exposure may occur through inhalation of dust particles and dermal contact with trioctyl phosphate at workplaces where it is produced or used. The general population may be exposed to trioctyl phosphate via inhalation of ambient air and ingestion of contaminated food and drinking water.</p>

### Section XIII. Disposal Considerations

Waste Disposal	Recycle to process, if possible. Consult your local regional authorities. You may be able to dissolve or mix material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber system. Observe all federal, state and local regulations when disposing of the substance.
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### Section XIV. Transport Information

DOT Classification	Not a DOT controlled material (United States).
PIN Number	Not applicable.
Proper Shipping Name	Not applicable.
Packing Group (PG)	Not applicable.
DOT Pictograms	

### Section XV. Other Regulatory Information and Pictograms

TSCA Chemical Inventory (EPA)	This compound is <b>ON</b> the EPA Toxic Substances Control Act (TSCA) inventory list.
WHMIS Classification (Canada)	CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC). CLASS D-2B: Material causing other toxic effects (TOXIC). On DSL.
EINECS Number (EEC)	201-116-6
EEC Risk Statements	R23/24/25- Toxic by inhalation, in contact with skin and if swallowed. R36/37/38- Irritating to eyes, respiratory system and skin. R45- May cause cancer.
Japanese Regulatory Data	ENCS No. 2-2000

**Section XVI. Other Information**

**Version 1.0**  
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**Notice to Reader**

TCI laboratory chemicals are for research purposes only and are NOT intended for use as drugs, food additives, household, or pesticides. The information herein is believed to be correct, but does not claim to be all inclusive and should be used only as a guide. Neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All chemical reagents must be handled with the recognition that their chemical, physiological, toxicological, and hazardous properties have not been fully investigated or determined. All chemical reagents should be handled only by individuals who are familiar with their potential hazards and who have been fully trained in proper safety, laboratory, and chemical handling procedures. Although certain hazards are described herein, we can not guarantee that these are the only hazards which exist. Our MSDS sheets are based only on data available at the time of shipping and are subject to change without notice as new information is obtained. Avoid long storage periods since the product is subject to degradation with age and may become more dangerous or hazardous. It is the responsibility of the user to request updated MSDS sheets for products that are stored for extended periods. Disposal of unused product must be undertaken by qualified personnel who are knowledgeable in all applicable regulations and follow all pertinent safety precautions including the use of appropriate protective equipment (e.g. protective goggles, protective clothing, breathing equipment, facial mask, fume hood). For proper handling and disposal, always comply with federal, state, and local regulations.

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