

Safety Data Sheet (SDS)

Date Issued : August 8, 2013

1. Product and Company Identification

Product Name: TCPP

Chemical Name: Tris(2-chloropropyl) Phosphate

CAS Number: 13674-84-5

EC Number: 911-815-4

Description: Reaction mass of tris(2-chloropropyl) phosphate and tris(2-chloro-1-methylethyl) phosphate and Phosphoric acid,bis(2-chloro-1-methylethyl) 2-chloropropyl ester and Phosphoric acid, 2-chloro-1-methylethyl bis(2-chloropropyl) ester.

Use of the product: flame-retardants in PU, rigid foam.

Supplier/ Producer:

Zhangjiagang Fortune Chemical Co., Ltd

Address: Rm 309, Bldg #8, Oriental New Plaza, Zhangjiagang City, Jiangsu Province, China 215600

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Email: sales@fortunechemtech.com Website: www.fortunechemtech.com

2. Hazards Identification

Note to section 2: Hazard identification is based on literature review for synthetic amorphous silica
(CAS No.13674-84-5)

Hazard-Risk Classification	Acute dermal toxicity	Category 5
	Acute Inhalation toxicity (Dusts and Mists)	Category 4

Label elements including precautionary statements

Symbol:



Signal Word: Warning

Safety Data Sheet (SDS)

Date Issued : August 8, 2013

Hazard-Risk Statement: H302 Harmful if swallowed

Precautionary Statement

***Prevention:** P264 Wash Hands and face thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

***Response:** P301+P310 If swallowed: immediately call a poison center or doctor/physician.

P330 Rinse mouth

P501 Dispose of contents/container to hazardous or special waste collection point.

Other Hazard-Risk which is not included in the classification criteria

NFPA HAZARD CLASSIFICATION			
Health	Fire	Reactive	Other
1	1	0	N/A
HMIS HAZARD CLASSIFICATION			
Health	Flammability	Physical Hazard	Protection
1	1	0	Please refer to Section 8

3. Composition/Information on Ingredients

Chemical Name	Other Name	CAS Number	Content (%)
Tris(2-chloropropyl) phosphate	Tris(chloroisopropyl) phosphate, TCPP	13674-84-5	≥ 99.9
Water	-	7732-18-5	< 0.1

4. First Aid Measures

Eye Contact: Flush eyes immediately with large amount of water for 15 minutes. If irritation occurs and persists, get medical treatment.

Skin Contact: Remove contaminated clothing and shoes from skin and wash thoroughly with soap and water or waterless cleanser. Get medical attention if irritation or other ill effects develop or persist.

Safety Data Sheet (SDS)

Date Issued : August 8, 2013

Inhalation:	If cough, shortness of breath or other breathing problems occur, move to fresh air. Seek medical attention if symptoms persist. If necessary, restore normal breathing through standard first aid measures.
Ingestion:	Do not induce vomiting. If conscious, give several glasses of water. Never give anything by mouth to an unconscious person. Material will pass through the body normally.
Acute and Delayed Symptoms/Effects:	Acute and Chronic high concentration of this material may cause irritation to eyes skin, respiratory tract and have an effect on Lung. <i>Note:</i> See section 11 for toxicological information
Indication of Immediate Medical Attention and Notes for Physician:	Treat symptomatically.

5. Fire and Ignition Information

Flash Point:	210°C
Explosion Limits in Air - Lower (g/m3):	Not available
Minimum Ignition Energy:	Not available
Burn Velocity:	Does not ignite (Brennzahl 1)
Extinguishing Media:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. The product is insoluble and floats on water.
Special Protective Equipment for Firefighters:	Wear suitable protective equipment. In the event of fire, wear self-contained breathing apparatus.
Specific Hazards:	Heating above 300°C leads to decomposition of

Safety Data Sheet (SDS)

Date Issued : August 8, 2013

Aerogel surface treatment. Decomposition vapor should be ventilated. May release formaldehyde when heated to high temperatures in the presence of air. Formaldehyde is a known skin and lung sensitizer and is regulated as a carcinogen.

Hazardous Decomposition and/or Combustion Products:

Carbon monoxide, Carbon dioxide, Organic products of decomposition, Formaldehyde.

Risk of Dust Explosion:

Dust may form explosive mixture in air. Take Precautionary measures against static discharges.

6. Accidental Release Measures

Personal Precautions:

Avoid dust formation. Ensure adequate ventilation. Remove all sources of ignition. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use personal protective equipment.

Protective equipment and emergency procedures

Eyes:

Use full face respirator.

Skin:

Wash at mealtime and end of shift. Wear protective clothing to minimize mechanical irritation.

Inhalation/Suitable

Respirator:

Respiratory protection recommended. Follow OSHA Respirator Regulations (29 CFR 1910.134) and use NIOSH/MHSA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.

Safety Data Sheet (SDS)

Date Issued : August 8, 2013

Precautionary Measures: Avoid eye and skin exposure. Avoid breathing dust. Keep container closed. Use reasonable care.

Note: These precautions are for room temperature handling. Use at elevated temperature or aerosol/spray applications may require added precautions.

Environmental precautions and protective procedures The product is insoluble and floats on water. If possible, try to contain floating material. The product is insoluble and floats on water. If possible, try to contain floating material. Prevent product from entering drains. Local authorities should be advised if significant spillages cannot be contained.

The methods of purification and removal: Remove possible ignition sources. Clean up promptly by vacuum. Sweep, mop or wipe up and contain for salvage or disposal. Fine powders may require special vacuum filters; damp mopping or washing is preferred. Pick up and transfer to properly labeled containers. Avoid dust formation.

7. Handling and Storage

Precautions for safe handling: Dust may be harmful if inhaled. Avoid dust formation. Do not breathe dust. Provide appropriate exhaust ventilation at machinery and at places where dust can be generated. Avoid contact with skin and eyes. Keep away from heat and sources of ignition. Take precautionary measures against static discharge. All metal parts of the mixing and processing equipment must be earthed/grounded. Ensure all equipment is electrically earthed/grounded before beginning transfer operations.

Conditions for safe storage: Keep containers tightly closed in a dry, cool and well-ventilated place. Keep in properly labeled containers. Do not store together with oxidizing materials and volatile chemicals as they may be adsorbed onto product.

8. Exposure Controls and Personal Protection

Safety Data Sheet (SDS)

Date Issued : August 8, 2013

Control parameters (e.g. occupational exposure limit values, biological limit values):

EXPOSURE LIMITS

There are no exposure limits identified for this specific product. Exposure limits for silica are stated below. **Silica 7631-86-9**

Austria	MAK: 4 mg/m ³ (TWA, Inhalable fraction)
Belgium	OEL: 10 mg/m ³ (TWA, Inhalable fraction), 3 mg/m ³ (TWA, Respirable fraction)
Germany	TRGS 900: 4 mg/m ³ (TWA, Inhalable fraction), 10 mg/m ³ (TWA, Inhalable fraction), 3 mg/m ³ (TWA, Respirable fraction)
Italy	OEL: 4 mg/m ³ (TWA, Inhalable fraction), 10 mg/m ³ (TWA, Inhalable fraction), 3 mg/m ³ (TWA, Respirable fraction)
Netherlands	MAC: 10 mg/m ³ (TWA, Inhalable fraction), 5 mg/m ³ (TWA, Respirable fraction)
Norway	1.5 mg/m ³ (TWA, Respirable fraction)
Spain	10 mg/m ³ (TWA, Inhalable fraction), 3 mg/m ³ (TWA, Respirable fraction)
Sweden	10 mg/m ³ (TWA, Inhalable fraction), 5 mg/m ³ (TWA, Respirable fraction)
UK	WEL: 6 mg/m ³ (TWA, Inhalable fraction), 2.4 mg/m ³ (TWA, Respirable fraction)
US	OSHA a PEL: 15 mg/m ³ (TWA, total dust), 5 mg/m ³ (TWA, Respirable fraction) ACGIH: 10 mg/m ³ (TWA, Inhalable fraction), 3 mg/m ³ (TWA, Respirable fraction)

MAK: Maximale Arbeitsplatzkonzentration (Maximum Workplace Concentration)

OEL: Occupational Exposure Limit

PEL: Permissible Exposure Limit

STEL: Short Term Exposure Limit

TLV: Threshold Limit Value

TRGS: Technische Regeln für Gefahrstoffe (Technical Rule for Hazardous Materials)

TWA: Time Weighted Average

US ACGIH: United States American Conference of Governmental Industrial Hygienists

US OSHA: United States Occupational Safety and Health Administration

VLA: Valore Límite Ambientales (Environmental Limit Value)

WEL: Workplace Exposure Limit

Engineering controls

Provide appropriate exhaust ventilation at machinery and at places where dust can be generated. Ensure adequate ventilation to maintain

Safety Data Sheet (SDS)

Date Issued : August 8, 2013

exposures below occupational limits.

Personal protective equipment

Respiratory protection: Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines.

Suitable Respirator: Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators.

Eye/Face protection: Use proper eye/face protection - safety glasses with side-shields as a minimum.

Skin protection: Repeated exposure may cause skin dryness or cracking. Use protective skin cream before handling the product. Wear suitable gloves for hands and protective clothing for body. Remove and wash contaminated clothing before re-use. No special protective equipment required.

9. Physical and Chemical Properties

Appearance: Colorless Liquid

Odour: Light odor

Odour threshold: Not determined.

pH: Not applicable

Melting point/Freezing point: not available

Flashing point: 210 °C (Closed Cup)

Evaporation rate: Not determined.

Safety Data Sheet (SDS)

Date Issued : August 8, 2013

Flammability (solid, gas):	Not determined.
Upper/lower flammability or explosive limits:	Not determined.
Vapor pressure:	Not determined.
Solubility:	Soluble in alcohol
Vapor density:	Not determined.
Relative density:	Not determined.
Partition coefficient(n-octanol/water):	Not determined.(Floats on water; disperses in oil)
Auto-ignition temperature:	Not determined
Decomposition temperature:	Not determined.
Viscosity:	Not determined.
Formula mass:	Not determined.

10. Stability and Reactivity

Chemical stability:	This product is stable.
Possibility of hazardous reactions:	Hazardous polymerization does not occur.
Conditions to avoid (e.g. static discharge, shock or vibration, etc.):	Do not expose to temperature above 250°C. Avoid conditions where oxygen may condense in or around this product, as this will increase the flammability.
Incompatibility with various substances:	Not available

Safety Data Sheet (SDS)

Date Issued : August 8, 2013

Hazardous decomposition products: Thermal breakdown of this product during fire or very high heat conditions may evolve the following decomposition products: Carbon oxides and traces of incompletely burned carbon compounds.

11. Toxicological Information

Note to section 11: Toxicological information is based on literature review for synthetic amorphous silica (CAS No. 7631-86-9)

Information on the likely routes of exposure

Inhalation: Inhalation of airborne dusts may cause mechanical irritation of the upper respiratory tract.

Skin Contact: Skin contact with dust from this product can produce a drying sensation and mechanical irritation of the skin and mucous membranes.

Eye Contact: Exposure to dust from this product can produce a drying sensation and mechanical irritation of the eyes.

Delayed, acute and chronic toxic effect for short and long term exposure

Acute toxicity (Oral) **Not Classified**
Rat LD50 >5110 mg/kg, OECD TG 401 GLP

Acute toxicity (Dermal) **Category 5**
Rabbit LD50 > 2000 mg/kg

Acute toxicity (Inhalation-dust) **Category 4**
Rat LC50 >2.2mg/L

Skin Corrosion/ Irritation **Not classified**
Not irritating (OECD Test Guidelines 404, GLP).
Slightly hazardous in case of skin contact on human are **not irritating to skin and eyes** under experimental

Safety Data Sheet (SDS)

Date Issued : August 8, 2013

conditions.

Serious Eye Damage/ Irritation

Not classified

Not irritating (OECD Test Guidelines 405, GLP).
Draize score 0.7/110, 24 hr. Non-irritating. Synthetic amorphous silica is **not irritating to skin and eyes** on human under experimental conditions.

Respiratory sensitizer

Not available

Skin Sensitization

Not classified

A delayed contact hypersensitivity study (Directive 84/449/EEC, B. 6) in guinea pigs utilizing the Buehler technique was performed. Not-sensitizing

Carcinogenicity

Not classified

Negative findings in a rat carcinogenicity (up to 5 % in the diet given to rats and mice)
Not listed by NTP, OSHA, ACGIH or EU.IARC: Group 3

Mutagenicity

Not classified

In vitro - Not mutagenic in Ames Test, chromosomal aberration in Chinese hamster ovary (CHO) cells.
In vivo – Not mutagenic in cytogenetic assay.

Reproductive toxicity Not classified

NOAEL>497 mg /kg bw/d

No evidence of adverse effects on reproduction performance

Specific target organ toxicity (single exposure)

Not classified

Silica gel administered intratracheally resulted in no fibrosis. The tissue reaction (peritoneal) to 11 types of amorphous silica was examined and 3 types failed to produce peritoneal fibrosis; 2 of these were dried precipitated silica and 1 was dried silica gel.

Safety Data Sheet (SDS)

Date Issued : August 8, 2013

**Specific target organ toxicity
(repeated exposure)**

Not classified

Inhalation

Human effects: The potential clinical toxicology of exposure to precipitated amorphous **silica** in 165 workers who had been exposed for an average of 8.6 years was studied. Serial pulmonary function values and chest radiographs were not adversely affected by long-term exposure to this dust.

Animal effects: NOAEL: 0.035 mg/L
(subchronic, 13 weeks).

Mild reversible pro-inflammatory cell proliferation, stimulation of collagen production, increase in lung weight, incipient interstitial fibrosis, slight focal atrophy in the olfactory epithelium.

Oral

Animal effects: NOAEL > 8% (sub-chronic, 13 weeks)
No clinical signs and other findings.

Aspiration Hazard

Not available

12. Ecological Information

Note to section 12: Ecological information is based on literature review for synthetic amorphous silica (CAS No. 7631-86-9).

Aquatic and terrestrial ecotoxicity Not classified

Fish 96hr LC50 > 10,000 mg/l (*Brachydanio rerio*, OECD TG 203)

Water flea 24hr EC50 > 10,000 mg/l (*Daphnia magna*, OECD TG 201)

Degradability

Stability Stable

Degradability The methods for determining biodegradability are not applicable to inorganic substances.

Safety Data Sheet (SDS)

Date Issued : August 8, 2013

Bioaccumulative potential

Biodegradable	Not applicable for inorganic material.
Enrichment	Not applicable for inorganic material.

Mobility in soil Insoluble. Not expected to migrate.

Other adverse effects None expected.

13. Disposal Considerations

Disposal method

Can be burned in suitable incineration plants or disposed of in a suitable landfill in accordance with the regulations issued by the appropriate federal, provincial, state and local authorities.

Disposal precaution

RCRA Hazard Class (40 CFR 261): Not classified.

14. Transport Information

Not classified as dangerous in the meaning of transport regulations.

Shipping Name: Not regulated for transport

Hazard Class / UN Number / Packing Group / Required Label(s) / Marine Pollutant / Additional Information / DOT Road Shipment Information (49 CFR 172.101) / Ocean Shipment (IMDG) / Air Shipment (IATA): None

15. Regulatory Information

Hazard Classification

United States - OSHA (29 CFR 1910.1200): Not hazardous.

Mexico - NOM-018-STPS-2000: Refer to HMIS Rating in Section 16.

Canada - WHMIS Classification (CPR, SOR/88-66): Not controlled.

International Inventories:

Safety Data Sheet (SDS)

Date Issued : August 8, 2013

This material is listed on or exempt from the following inventories:

- Australian Inventory of Chemical Substances (AICS) / Canadian Domestic Substances List (DSL) / European Inventory of Existing Commercial Chemical Substances (EINECS) / New Zealand Hazardous Substances and New Organisms Act (HSNO) / United States Toxic Substances Control Act (TSCA) Inventory: **YES**
- Chinese Inventory / Japanese Inventory of Existing and New Chemical Substances (ENCS) / Korean Existing Chemicals List (KECL) / Philippines Inventory of Chemicals and Chemical Substances (PICCS): **No**

NOTE: The chemicals in this product may not be subject to notification in the following countries under an "article" exemption: Canada, Japan, Korea, New Zealand and Switzerland.

U.S. Federal Regulations

TSCA 12(b) Export Notification: This product does not contain any components that are subject to TSCA 12(b) Export Notification.

Clean Air Act Amendments of 1990 (CAA, Section 112, 40 CFR 82): This product does not contain any components listed as a Hazardous Air Pollutant, Flammable Substance, Toxic Substance, or Class 1 or 2 Ozone Depletory.

Clean Water Act (CWA, 40 CFR 116) Priority Pollutants: This product does not contain any listed Priority Pollutants.

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, 40 CFR 302): This product does not contain any listed Hazardous Substances.

Superfund Amendments and Reauthorization Act, Title III (SARA): SARA Section 302 (40 CFR 355) Extremely Hazardous Substances: No components are listed as extremely hazardous chemicals under SARA Section 302. SARA Sections 311/312 (40 CFR 370) Hazard Category: This product does not meet any of the MSDS Requirement definitions for a hazardous material under SARA Sections 311/312. SARA Section 313 (40 CFR 372) Toxics Release Inventory: Does not contain any of the substances identified under Section 313 as toxic chemicals in excess of the minimum concentrations necessary to be subject to this rule.

Pharmaceutical Information: Not permitted U.S. State Regulations

California Proposition 65: This product does not contain any components listed on California Proposition 65.

US Coalition of North Eastern Governors (CONEG) Metals List: This product meets the CONEG Source Reduction Council limits for the sum of the levels of lead, cadmium, mercury and hexavalent chromium of less than 100 parts per million by weight.

Safety Data Sheet (SDS)

Date Issued : August 8, 2013

EC Regulatory Information

Product is not classified as a dangerous material or preparation as defined in EC Directives 67/548/EEC or 1999/45/EC and EU CLP.

16. Other Information

Information source and references

Korea Occupational Health & Safety Agency: <http://www.kosha.net>

National Library of Medicine (NLM) Hazardous Substances Data Bank (HSDB):

<http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB.htm>

ECOTOX Database, EPA (<http://cfpub.epa.gov/ecotox>)

ECB-ESIS (European Chemical Substances Information System) (<http://ecb.jrc.it/esis>)

International Uniform Chemical Information Database (IUCLID) (<http://ecb.jrc.it/esis>)

International Program on Chemical Safety (IPCS INCHEM) (<http://www.inchem.org/>)

REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008

American Conference of Governmental Industrial Hygienists TLVs and BEIs. Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices.

Cincinnati, OH, 2008, p. 35

IARC. Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man. Geneva:

World Health Organization, International Agency for Research on Cancer, 1972-PRESENT.

(Multivolume work), p. S7 216 (1987)

United Nations Environmental Programme (UNEP)

Organization for Economic Co-operation and Development (OECD) Screening Information Data Set (SIDS) Initial Assessment Report, Synthetic Amorphous Silica, July 23, 2004