

BIO/TEC 320

Material Safety Data Sheet

Revision Date: April 23, 2009

1. IDENTIFICATION OF THE PRODUCT AND THE COMPANY

Product Name: BIO/TEC 320
Chemical Family: Antimicrobial
Supplier: SOUTHWEST ENGINEERS
39478 Highway 190 East
Slidell, LA 70461
Telephone: (985) 643-1117
Fax: (985) 641-4509
Emergency Number: (800) 424-9300 - Chemtrec

	HMIS	NFPA
Health =	2	2
Fire =	0	0
Reactivity =	1	1

Hazard Ratings:
0 = Least
1 = Slight
2 = Moderate
3 = High
4 = Extreme

2. HAZARDOUS INGREDIENTS

Product composition contains the following hazardous components reportable under OSHA Regulation 29 CFR 1910.1200:

Component	CAS #	OSHA Hazard	%Weight
Tetrakis (hydroxymethyl) phosphonium sulfate; THPS	55566-30-8	Y	18-22

3. PHYSICAL DATA

Physical Appearance: Colorless/Liquid
Odor: Characteristic odor
Boiling point: 108°C (226°F) at 759 mmHg
Freezing point range: ~ -3°C (27°F)
Melting point range: Not available
Vapor pressure (mm Hg at 20°C): Not available
Vapor density (air = 1): Not available
Solubility in water: Soluble
pH: 3 – 6 at 100 wt/wt%
Specific gravity: Not available
Density: 0.95 to 1.15 g/ml @ 20°C (68°F)
Molecular weight: 406.3
% volatile by volume: 80%

4. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Physical Appearance and Odor: colorless / liquid, characteristic odor.

Warning Statements:

DANGER! RISK OF SERIOUS DAMAGE TO EYES. HARMFUL IF INHALED. MAY BE HARMFUL IF INGESTED. MAY CAUSE ALLERGIC SKIN REACTION. POSSIBLE DEVELOPMENTAL HAZARD, MAY ADVERSELY EFFECT THE DEVELOPING FETUS (BASED ON ANIMAL DATA).

POTENTIAL HEALTH EFFECTS

Acute Eye:	Expected to cause significant irritation to the eyes. Can cause tearing, pain, burns, permanent damage to the cornea.
Acute Skin:	May cause irritation upon prolonged contact. May cause sensitization.
Acute Inhalation:	Harmful if inhaled. May cause coughing, shortness of breath, chest pain.
Acute Ingestion:	May be harmful if swallowed. May cause nausea, vomiting.
Chronic Effects:	Repeated, prolonged ingestion may cause liver damage. (See Section 11 – Chronic for a discussion of animal studies.) In a rabbit study, animals fed this product during pregnancy produced an increase in the numbers of offspring with eye abnormalities and/or minor skeletal variations, only at doses that also caused material (parental) toxicity. (See Section 11 for details of chronic studies.)

5. EMERGENCY & FIRST AID PROCEDURES

FIRST AID MEASURES FOR ACCIDENTAL:

Eye Exposure:	Hold eyelids open and flush with a steady, gentle stream of water for at least 15 minutes. Seek immediate medical attention.
Skin Exposure:	In case of contact, immediately wash with plenty of soap and water for at least 15 minutes. Seek medical attention. Remove contaminated clothing and shoes while washing. Clean contaminated clothing and shoes before re-use or discard if they cannot be thoroughly cleaned.
Inhalation:	Remove victim from immediate source of exposure and assure that the victim is breathing. If breathing is difficult, administer oxygen, if available. If victim is not breathing, administer CPR (cardio-pulmonary resuscitation). Seek medical attention.

5. EMERGENCY & FIRST AID PROCEDURES – con't.

Ingestion: Wash out mouth with water and keep at rest. Seek immediate medical attention. Do not induce vomiting unless instructed to do so by a physician.

MEDICAL CONDITIONS POSSIBLY AGGRAVATED BY EXPOSURE:

Skin contact may aggravate existing skin disease.

NOTES TO PHYSICIAN:

All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

Treat symptomatically. No specific antidote available.

6. FIRE AND EXPLOSION HAZARD DATA

FIRE HAZARD DATA:

Flash Point: Not Applicable

Extinguishing Media: Recommended: water fog, carbon dioxide, dry chemical, foam.

Special Fire Fighting Procedures: Firefighters should wear NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing. Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind; keep out of low areas. Evacuate residents who are downwind of fire.

Unusual Fire and Explosion Hazards: Containers may explode (due to the build-up of pressure) when exposed to extreme heat.

Hazardous Decomposition Materials (Under Fire Conditions): Oxides of sulfur, phosphorus and carbon.

7. ACCIDENTAL RELEASE MEASURES

Evacuation Procedures and Safety: Ventilate closed spaces before entering. Personnel handling this material should be thoroughly trained to handle spills and releases. Wear appropriate protective gear for the situation. Evacuate and isolate spill area. See Personal Protection information in Section 9. Evacuate and isolate spill area.

Containment of Spill: Stop leak if it can be done without risk. Dike spill using absorbent or impervious materials such as earth, sand or clay. Dike area to prevent runoff. Collect and contain contaminated absorbent and dike material for disposal.

7. ACCIDENTAL RELEASE MEASURES – con't.

Cleanup and Disposal of Spill:

Recover material, if possible. DO NOT RETURN MATERIAL TO ITS ORIGINAL CONTAINER. Absorb with an inert absorbent. Shovel up into an appropriate closed container (see Section 8: Handling and Storage). Clean up residual material by washing area with water. Collect washings for disposal. The material should be properly packaged and disposed of in compliance with applicable regulations. Decontaminate tools and equipment following cleanup.

Environmental and Regulatory Reporting:

Do not flush to drain. Runoff from fire control or dilution water may cause pollution. Prevent material from entering public sewer system or any waterways. Spills may be reportable to the National Response Center (800-424-8802) and to state and/or local agencies.

8. HANDLING AND STORAGE

Minimum/Maximum Storage Temperatures: Not Available

Handling:

Personnel handling this product should be thoroughly trained as to its hazards. Do not get on skin or in eyes. Do not breathe vapors and mists. Avoid direct or prolonged contact with skin and eyes. Use only as directed.

****HAZARD WARNING:** This product belongs to a chemical family that HAS BEEN TESTED in combination with Trimethylolpropane, Trimethylolpropane derived products or their corresponding Trimethylolpropane homologs for toxicity of the thermal decomposition products in the absence of flame. Products in this chemical family PRODUCED OBSERVABLE ADVERSE HEALTH EFFECTS in laboratory animals. There is a possibility that this thermal decomposition produces bicyclic phosphates and/or phosphates. Bicyclic phosphates and phosphates have acute neurotoxic properties and may cause convulsive seizures in laboratory test animals. Therefore, this product should be used in conjunction with Trimethylolpropane or Trimethylolpropane derived products unless tested to determine their decomposition toxicity. Follow all precautionary measures outlined in this material safety data sheet.

Storage:

Store in an area that is clean, cool, dry, well-ventilated, Store away from; bases, oxidizers, reducing agents, Store in tightly closed containers. Container material to avoid: ordinary steel, Recommended container material: high density, high molecular weight polyethylene containers. Store in original container.

9. SAFE HANDLING & USE INFORMATION

These recommendations provide general guidance for handling this product. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. While developing safe handling procedures, do not overlook the need to clean equipment and piping systems for maintenance and repairs. Waste resulting from these procedures should be handled in accordance with Section 13: Disposal Considerations.

Assistance with selection, use and maintenance of worker protection equipment is generally available from equipment manufacturers.

Exposure Guidelines:

Exposure limits represent regulated or recommended worker breathing zone concentrations measured by validated sampling and analytical methods, meeting the regulatory requirements. The following limits apply to this material, where, if indicated, S=skin and C=ceiling limit:

TETRAKIS(HYDROXYMETHYL) PHOSPHONIUM SULFATE

ACGIH

Notes

TWA
2 mg/cu m

STEL

Engineering Controls:

Where engineering controls are indicated by use conditions or a potential for excessive exposure exists, the following traditional exposure control techniques may be used to effectively minimize employee exposures: general area dilution/exhaust ventilation.

Respiratory Protection:

When respirators are required, select NIOSH/MSHA approved equipment based on actual or potential airborne concentrations and in accordance with the appropriate regulatory standards and/or industrial recommendations.

Eye/Face Protection:

Eye and face protection requirements will vary dependent upon work environment conditions and material handling practices. Appropriate ANSI Z87 approved equipment should be selected for the particular use intended for this material.

Eye contact should be prevented through use of chemical safety glasses with side shields or splash proof goggles. An emergency eye wash must be readily accessible to the work area. Face contact should be prevented through use of a face shield.

Skin Protection:

Skin contact should be prevented through use of suitable protective clothing, gloves and footwear, selected with regard for use conditions and exposure potential. Consideration must be given both to durability as well as permeation resistance.

9. SAFE HANDLING & USE INFORMATION – con't.

Work Practice Controls:

Personal hygiene is an important work practice exposure control measure and the following general measures should be taken when working with or handling this material:

- (1) Do not store, use, and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is stored.
- (2) Wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics, or using the toilet.
- (3) Wash exposed skin promptly to remove accidental splashes or contact with this material.

10. STABILITY & REACTIVITY DATA

Chemical Stability:

This material is stable under normal handling and storage conditions described in Section 8. Under unusual conditions, such as very high temperatures and/or in the presence of strong reducing agents, the product may break down to form hazardous decomposition products noted below. The customer is advised to seek further advice Southwest Engineers' Technical Department when considering such applications.

Conditions To Be Avoided:

Heat
Temperatures above 160°C.
See HAZARD WARDING under HANDLING in Section 8.

Materials/Chemicals To Be Avoided:

strong bases
strong acids
strong oxidizing agents
strong reducing agents

Decomposition Temperature Range:

> 160°C (320°F)

The following Hazardous Decomposition Products might be expected:

Decomposition Type:

thermal
oxides of sulfur
oxides of phosphorus
oxides of carbon
phosphine gas

Hazardous Polymerization Will Not Occur.

Avoid the following to inhibit Hazardous Polymerization:

Not Applicable

11. TOXICOLOGICAL INFORMATION

Acute Eye Irritation:

Toxicological Information and Interpretation:

eye - eye irritation, rabbit. Severely irritating. This material is expected to cause significant irritation to the eyes.

Acute Skin Irritation:

Toxicological Information and Interpretation:

skin - skin irritation, rabbit. Minimally irritating. This material is not expected to cause significant irritation to the skin.

skin - sensitization, guinea pig. Sensitizing. May cause significant allergic skin reaction.

Acute Dermal Toxicity:

The following data is for similar or related products.

Toxicological Information and Interpretation:

LD50 - lethal dose 50% of test species, > 2000 mg/kg, rat. Material tested was a 75% aqueous solution of Tetrakis (hydroxymethyl) phosphonium sulfate.

Acute Respiratory Irritation:

No test data found for product.

Toxicological Information and Interpretation:

lung - lung irritation (qualitative), **. This material is not expected to cause significant irritation to the respiratory tract.

Acute Inhalation Toxicity:

The following data is for similar or related products.

Toxicological Information and Interpretation:

LC50 - lethal concentration 50% of test species, 0.59 mg/l/4 hr, rat. Material tested was a 75% aqueous solution of Tetrakis (hydroxymethyl) phosphonium sulfate.

Acute Oral Toxicity:

The following data is for similar or related products.

Toxicological Information and Interpretation:

LD50 - lethal dose 50% of test species, 575 mg/kg, rat. Material tested was a 75% aqueous solution of Tetrakis (hydroxymethyl) phosphonium sulfate.

11. TOXICOLOGICAL INFORMATION – con't.

Chronic Toxicity:

This product does not contain any substances that are considered by OSHA, NTP, IARC or ACGIH to be "probable" or "suspected" human carcinogens.

The following data is for similar or related products.

Toxicological Information and Interpretation

REPRODUCTIVE TOXICITY	Rat. No impairment of fertility was observed in a two generation feeding study. Material tested was a 75% aqueous solution of Tetrakis (hydroxymethyl) phosphonium sulfate.
CARCINOGENICITY, **.	There was no evidence of carcinogenicity in F344/N rats and B6C3F1 mice (both sexes) dosed by gavage at 5 or 10 mg THPS/kg/day for 2 years. ^a ref. NTP study report TR296, 1987].
MUTAGENICITY, **.	Ames Test: Negative.
MUTAGENICITY, **.	Chinese hamster ovary cells (chromosomal aberrations): Positive.
TERATOGENICITY, **.	A developmental toxicity study in rabbits resulted in statistically significant developmental effects in offspring, principally including eye malformations, hydrocephaly and skeletal variations, at doses that also caused material (parental) bodyweight gain reduction. The NO Observed Effect Level (NOEL) for development toxicity and material toxicity (rabbit) = 18 mg/kg/day. A developmental toxicity study in rats showed a statistically significant increase only in one skeletal variation (supernumary ribs), at doses that also caused maternal toxicity. The No Observed Effect Level for developmental toxicity (rat) = 30 mg/kg/day; No observed effect level for material toxicity (rat) = 15 mg/kg/day. Material tested was a 75% aqueous solution of Tetrakis (hydroxymethyl) phosphonium sulfate. Medical surveillance for over 30 years has shown no evidence of developmental toxicity from long-term exposure nor from exposure following an acute incident, for example, a major or minor spillage.
MUTAGENICITY, **.	Dominant Lethal Assay ^a rat (in vivo): Negative
MUTAGENICITY, **.	Mouse micronucleus (in vivo): Negative.
MUTAGENICITY, **.	Unscheduled DNA synthesis assay: Negative. Material tested was a 75% aqueous solution of Tetrakis (hydroxymethyl) phosphonium sulfate. –
SUB-CHRONIC EXPOSURE,	1 mg/kg/90 days, rat. Material tested was a 75% aqueous solution of Tetrakis (hydroxymethyl) phosphonium sulfate.

12. ECOLOGICAL INFORMATION

Ecotoxicological Information:

The following data is based on the technical grade active ingredient(s) (TGAi).

Ecotoxicological Information and Interpretation:

LC50 - lethal concentration 50% of test species, 19.4 mg/l/48 hr, Daphnia magna.

LC50 - lethal concentration 50% of test species, 93 mg/l/96 hr, bluegill sunfish (*Lepomis macrochirus*).

LC50 - lethal concentration 50% of test species, 119 mg/l/96 hr, rainbow trout (*Oncorhynchus mykiss*).

LC50 - lethal concentration 50% of test species, 86 mg/l/96 hr, Juvenile Plaice.

LC50 - lethal concentration 50% of test species, 340 mg/l/96 hr, Brown Shrimp.

LC50 - ecotox Method for association with dry sediment weight., 2174 mg/kg/10 days, *Corophium volutator*. (dry sediment weight).

LD50 - lethal dose 50% of test species, 311 mg/kg, Mallard duck (*Anas platyrhynchos*). Material tested was a 75% aqueous solution of Tetrakis (hydroxymethyl) phosphonium sulfate.

Chemical Fate Information:

Product is not expected to bioaccumulate. THPS has been shown to degrade rapidly once diluted to sub-ppm concentrations and forms trishydroxymethyl phosphine oxide which is classified as non-toxic.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method:

Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate. Please be advised that state and local requirements for waste disposal may be more restrictive or otherwise different from federal laws and regulations. Consult state and local regulations regarding the proper disposal of this material.

EPA Hazardous Waste

NO

14. TRANSPORTATION INFORMATION

Transportation Status: IMPORTANT! Statements below provide additional data on listed DOT classification.

The listed Transportation Classification does not address regulatory variations due to changes in package size, mode of shipment or other regulatory descriptors.

US Department of Transportation

Shipping Name:
NOT REGULATED

15. REGULATORY INFORMATION

Inventory Status

Inventory	Status
UNITED STATES (TSCA)	E
CANADA (DSL)	N
EUROPE (EINECS/ELINCS)	P
AUSTRALIA (AICS)	N
JAPAN (MITI)	N
SOUTH KOREA (KECL)	N

Y = All ingredients are on the inventory.

E = All ingredients are on the inventory or exempt from listing.

P = One or more ingredients fall under the polymer exemption or are on the no longer polymer list.
All other ingredients are on the inventory or exempt from listing.

N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing.

FEDERAL REGULATIONS

Inventory Issues:

This product is excluded from TSCA because it is solely for FIFRA regulated use.

SARA Title III Hazard Classes:

Fire Hazard	NO
Reactive Hazard	NO
Release of Pressure	NO
Acute Health Hazard	YES
Chronic Health Hazard	YES

16. OTHER INFORMATION

Key Legend Information:

ACGIH - American Conference of Governmental Industrial Hygienists
OSHA - Occupational Safety and Health Administration
TLV - Threshold Limit Value
PEL - Permissible Exposure Limit
TWA - Time Weighted Average
STEL - Short Term Exposure Limit
NTP - National Toxicology Program
IARC - International Agency for Research on Cancer
ND - Not determined

The information herein is presented in good faith and believed to be correct as of the date hereof. However, Southwest Engineers makes no representation as to the completeness and accuracy thereof. Users must make their own determination as to the suitability of the product for their purposes prior to use.

No representations or warranties, either expressed or implied, of merchantability, fitness for a particular purpose or of any other nature with respect to the product or to the information herein is made. Southwest Engineers shall in no event be responsible for any damages of whatsoever nature directly or indirectly resulting from the publication or use or reliance upon information contained herein.

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