TOLCIDE® PS50A

INDUSTRIAL ANTIMICROBIAL

ACTIVE INGREDIENT:
Tetraalkyl(hydroxymethyl) phosphonium sulfate ........................................ 50%
OTHER INGREDIENTS: .................................................................................. 50%
TOTAL: ........................................................................................................ 100%

EPA Reg. No. 4564-17
EPA Est. 56485-PA-001

KEEP OUT OF REACH OF CHILDREN

DIRECTIONS FOR USE

IndustriAL AND/or COMMERCIAL RECIRCULATING COOLING WATER SYSTEMS (For control of bacteria, fungi and algae)

Initial Slug Dose: Add 140-525 ppm of TOLCIDE® PS50A (70-262.5 ppm THPS) based on total water volume. Repeat until control is obtained. Thereafter, add 2 Intermittently 2-520 ppm of TOLCIDE® PS50A (26-106 ppm THPS) or Continuously 28-98 ppm of TOLCIDE® PS50A (14-49 ppm THPS) per day.

Dirt systems must be cleaned prior to treatment.

HEAT TRANSFER SYSTEMS (Evaporative Condensers, Dairy Sweetwater Systems, Hydrotatic Sterilizers and Retorts, Brewery and Other Pasteurizers, and Warmers)

Add TOLCIDE® PS50A at the same application rates, and in the same manner as described above. It should be added to the system at a point of uniform mixing such as a basin area, sump area, or other reservoir or collecting area from which the treated water will be circulated uniformly throughout the system.

SERVICE WATER AND AUXILIARY SYSTEMS

TOLCIDE® PS50A should be added to service water and auxiliary systems at the same application rates, and in the same manner as described above. It should be added to the system at a point of uniform mixing such as a basin area, sump area, or other reservoir or collecting area from which the treated water will be circulated uniformly throughout the system.

AIR WASHER SYSTEMS (Not for use in California)

For control of fungi and algae. This product may be used only in air washer systems which have minimal circulating components. Pre-clean the system with detergent and allow air washer to run on fan for ten hours. Flush and check nozzles, manually cleaning as necessary. Add 52-140 ppm of TOLCIDE® PS50A (26-70 ppm THPS) at a point where uniform mixing and even distribution will occur. Repeat as needed to maintain control.

PAPER MANUFACTURING (For control of bacteria, fungi and algae)

a) For use as a dilucide in the manufacture of paper and paperboard products and adhesives that do not contact food.

Dosing: Additions should be made at a point in the system where mixing action is good, e.g. raw stock chest beater or mixing unit.

Intermittently Dosing: Add 49-700 ppm of TOLCIDE® PS50A (24.5-350 ppm THPS) based on total water volume at an equivalent based on dry weight of paper produced.

Continuous Dosing: Add 28-98 ppm of TOLCIDE® PS50A (14-49 ppm THPS) based on total water volume or an equivalent based on dry weight of paper produced.

b) For use as a preservative to retard microbial growth in water-based coatings, starches, pigments and filler slurries. Do not use in paper and paperboard adhesives that will contact food. (Not for use in New York State and California)

The treatment rate necessary to retard spoilage of the additive will vary with the extent of contamination of make-up water and the length of storage.

Dosing: Apply from 50-300 ppm of TOLCIDE® PS50A (275-500 ppm THPS) to the additive to be preserved based on the total weight of the additive and water.

INDUSTRIAL FRESH WATER SYSTEMS (Not for use in California)

Do not use in freshwater used in the manufacture of paper and paperboard products that may contact food.

TOLCIDE® PS50A is effective in controlling algae in holding ponds and in controlling bacteria and fungi in holding and processing tanks of industrial fresh water systems supplying water to pulp and paper mills, textile mills, and other manufacturing plants. In pulp and paper mills, treatment of the fresh water with TOLCIDE® PS50A can make an important contribution to slime control. The use of TOLCIDE® PS50A as described will reduce the development of slime in fresh water systems and other large water systems, and in the pulp and paper mill machine parts contacted by fresh water.

For the control of algae in industrial fresh water systems, TOLCIDE® PS50A should be added to provide a concentration of 2-20 ppm of product (1-90 ppm of THPS). Treatment should be based on the amount of water entering a pond or reservoir or leaving the pond or reservoir and entering the immediate processing operations. While treatment can be made continuous, regular slug-dosing treatment will provide adequate control.

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

STORAGE: Store this product in a cool, dry area away from direct sunlight and heat to avoid damage. Keep the product in tight containers.

PECIDICIDE DISPOSAL: Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsates is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmantal Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

CONTAINER DISPOSAL: Triple rinse (or equivalent) all containers and offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill or other approved procedures approved by state and local authorities.

Note: Seller makes no warranty, expressed or implied, concerning the use of this product other than as indicated on the label. Buyer assumes all risk and handling of this material, such use and handling contrary to label directions. TOLCIDE® is a registered trademark of Rhodia UK Limited.
SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier
Trade name : TOLCIDE PS50A
FIFRA Registration number : 4564-17

1.2 Relevant identified uses of the substance or mixture and uses advised against
Uses of the Substance / Mixture : Specific use(s): FIFRA regulated use only., Biocidal product

1.3 Details of the supplier of the safety data sheet
Company : Solvay USA Inc., NOVECARE
8 Cedar Brook Drive
Cranbury, NJ, 08512-7500, US
Telephone number: 800-973-7873

1.4 Emergency telephone
FOR EMERGENCIES INVOLVING A SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT CONTACT: CHEMTREC 800-424-9300 within the United States and Canada, or 703-527-3887 for international collect calls.

SECTION 2: Hazards identification

Although OSHA has not adopted the environmental portion of the GHS regulations, this document may include information on environmental effects.

2.1 Classification of the substance or mixture
HCS 2012 (29 CFR 1910.1200)
Acute toxicity, Category 4 : H302: Harmful if swallowed.
Acute toxicity, Category 3 : H331: Toxic if inhaled.
Serious eye damage, Category 1 : H318: Causes serious eye damage.
Skin sensitization, Category 1 : H317: May cause an allergic skin reaction.
Reproductive toxicity, Category 2 : H361: Suspected of damaging fertility or the unborn child.

2.2 Label elements
HCS 2012 (29 CFR 1910.1200)
Pictogram :
Signal Word: Danger

**Hazard Statements:**

H302 Harmful if swallowed.
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.
H331 Toxic if inhaled.
H361 Suspected of damaging fertility or the unborn child.

**Precautionary Statements:**

**Prevention**
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P261 Avoid breathing dust/fume/gas/mist/vapors/spray.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P272 Contaminated work clothing must not be allowed out of the workplace.
P280 Wear eye protection/face protection.
P280 Wear protective gloves.
P281 Use personal protective equipment as required.

**Response**
P301 + P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313 IF exposed or concerned: Get medical advice/attention.
P310 Immediately call a POISON CENTER or doctor/physician.
P330 Rinse mouth.
P333 + P313 If skin irritation or rash occurs: Get medical advice/attention.
P363 Wash contaminated clothing before reuse.

**Storage**
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.

**Disposal**
P501 Dispose of contents/container to an approved waste disposal plant.

**2.3 Other hazards which do not result in classification**

H400: Very toxic to aquatic life.
H411: Toxic to aquatic life with long lasting effects.

Possible damage to liver following repeated or prolonged exposure by ingestion.
SECTION 3: Composition/information on ingredients

3.1 Substance
Not applicable, this product is a mixture.

3.2 Mixture
Chemical nature: Aqueous solution

Hazardous Ingredients and Impurities

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Identification number CAS-No.</th>
<th>Concentration [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetrakis(Hydroxymethyl) Phosphonium Sulfate</td>
<td>55566-30-8</td>
<td>50</td>
</tr>
</tbody>
</table>

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice: Show this material safety data sheet to the doctor in attendance.
First responder needs to protect himself.
Place affected apparel in a sealed bag for subsequent decontamination.
Plan first aid action before beginning work with this product.
In the case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

If inhaled: Move to fresh air.
Keep at rest.
Consult a physician.

Skin contact: Take off contaminated clothing and shoes immediately.
Wash off with plenty of water.
Wash immediately and thoroughly for a prolonged period (at least 15 minutes).
Get medical attention if irritation develops and persists.

Eye contact: Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
Get immediate medical advice/attention.

Ingestion: Do not induce vomiting without medical advice.
If victim is conscious:
Rinse mouth with water.
Keep at rest.
Never give anything by mouth to an unconscious person.
Do not leave the victim unattended.
Vomiting may occur spontaneously
Risk of product entering the lungs on vomiting after ingestion.
Lay victim on side.
Get immediate medical advice/attention.
4.2 Most important symptoms and effects, both acute and delayed

**Symptoms**: Lachrymation
Ingestion may provoke the following symptoms:
- Nausea
- Liver disorders

**Risks**: Skin contact may aggravate existing skin disease

4.3 Indication of any immediate medical attention and special treatment needed

**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.
- There is no specific antidote available.

SECTION 5: Firefighting measures

**Flash point**: Not applicable (aqueous liquid).

**Autoignition temperature**: Not applicable

**Flammability / Explosive limit**: no data available

5.1 Extinguishing media

**Suitable extinguishing media**: In case of fire, use water/water spray/water jet/carbon dioxide/sand/foam/alcohol resistant foam/chemical powder for extinction.

**Unsuitable extinguishing media**: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

5.2 Special hazards arising from the substance or mixture

**Specific hazards during fire fighting**: Harmful or toxic vapors are released. Do not allow run-off from fire fighting to enter drains or water courses.
Under fire conditions:
- Will burn (following evaporation of water)
- Hazardous decomposition products
- Phosphorus trihydride (phosphine)
- Oxides of phosphorus
- Sulfur oxides
- Carbon oxides

5.3 Advice for firefighters

**Special protective equipment for fire-fighters**: Firefighters should wear NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing.
In the event of fire, wear self-contained breathing apparatus. Personal protective equipment comprising: suitable protective gloves, safety goggles and protective clothing.

Specific fire fighting methods: Standard procedure for chemical fires.

Further information: Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions, protective equipment and emergency procedures: Do not breathe spray. Avoid contact with the skin and the eyes. Use personal protective equipment. Ensure adequate ventilation. Evacuate personnel to safe areas.

6.2 Environmental precautions

Environmental precautions: Do not allow uncontrolled discharge of product into the environment. Contain the spilled material by diking. Do not flush into surface water or sanitary sewer system. Do not let product enter drains. Spills may be reportable to the National Response Center (800-424-8802) and to state and/or local agencies.

6.3 Methods and materials for containment and cleaning up

Recovery: Contain spillage, soak up with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and transfer to a container for disposal according to local / national regulations (see section 13). Keep in suitable, closed containers for disposal.

: Never return spills in original containers for re-use.

Decontamination / cleaning: Wash nonrecoverable remainder with large amounts of water. Recover the cleaning water for subsequent disposal.

: Decontaminate tools, equipment and personal protective equipment in a segregated area.

Disposal: Dispose of contents/container to an approved waste disposal plant. Dispose of in accordance with local regulations.
6.4 Reference to other sections

Reference to other sections : For personal protection see section 8.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Technical measures : Provide adequate ventilation.

Advice on safe handling and usage : Avoid exposure - obtain special instructions before use.
This product must only be handled by skilled operators.
Reduce the duration of exposure to the minimum required.

Avoid formation of aerosol.
Avoid the formation or spread of mists in the atmosphere.
Handle in accordance with good industrial hygiene and safety practice.
Use only with adequate ventilation/personal protection.

Do NOT handle without gloves.

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

7.2 Conditions for safe storage, including any incompatibilities

Technical Measures for storage : Prevent unauthorized access.
Keep container tightly closed in a dry and well-ventilated place.
Containers which are opened must be carefully resealed and kept upright to
prevent leakage.
Take all necessary measures to avoid accidental discharge of products into
drains and waterways due to the rupture of containers or transfer systems.

Storage conditions

Recommended : Keep in a dry, cool and well-ventilated place.
Keep container tightly closed.

To be avoided : Keep away from incompatible materials to be indicated by the manufacturer
Keep away from open flames, hot surfaces and sources of ignition.

Incompatible products : Do not mix with incompatible materials (See list, section 10).
Packaging Measures

Packaging Measures: Polyethylene or polypropylene drums., Stainless steel
Packaging materials—Recommended: Plastic materials (polyethylene).
Packaging materials—To be avoided: Ordinary steel.

Storage stability

Storage temperature: no data available
Other data: No decomposition if stored and applied as directed.

7.3 Specific end use(s)
no data available

SECTION 8: Exposure controls/personal protection

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

8.1 Control parameters

Ingredients with workplace control parameters

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Value type</th>
<th>Value</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetrakis(Hydroxymethyl) Phosphonium Sulfate</td>
<td>TWA</td>
<td>2 mg/m3</td>
<td>ACGIH</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Central nervous system, 2014 Adoption, Not classifiable as a human carcinogen</td>
</tr>
</tbody>
</table>

8.2 Exposure controls

Control measures

Engineering measures: 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:

- Avoid splashes.
- Effective exhaust ventilation system
- Facilities and equipment easily cleanable.
- Separate rooms are required for washing, showering and changing clothes.
Personal protective equipment

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.

Use a respirator with an approved filter if a risk assessment indicates this is necessary.

Hand protection: Glove material: Polyvinyl alcohol or nitrile-butyl-rubber gloves
Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time.

Gloves must be inspected prior to use.

Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

Eye 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 the use of:

Safety glasses with side-shields
In case of contact through splashing:
Wear face-shield and protective suit.

Skin and body protection: Wear suitable protective clothing, gloves and eye/face protection.

Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Remove and wash contaminated apparel.

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

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 material.

Protective measures: Always have on hand a first-aid kit, together with proper instructions.

Ensure that eyewash stations and safety showers are close to the workstation location.

The protective equipment must be selected in accordance with current local standards and in cooperation with the supplier of the protective equipment.

Selection of appropriate personal protective equipment should be based on an evaluation of the performance characteristics of the protective equipment relative to the task(s) to be performed, conditions present, duration of use, and the potential hazards, and/or risks that may occur during use.
SECTION 9: Physical and chemical properties

Physical and Chemical properties here represent typical properties of this product. Contact the business area using the Product information phone number in Section 1 for its exact specifications.

9.1 Information on basic physical and chemical properties

Appearance : Form : Aqueous solution
Physical state: liquid
Color: pale yellow to pale pink

Odor : characteristic

Odor Threshold : no data available

pH : 3.0 - 4.0 (1 % (m/v))

Freezing point : < 14 °F (< -10 °C)

Flash point : Not applicable (aqueous liquid).

Evaporation rate (Butylacetate = 1) : no data available

Flammability (solid, gas) : The product is not flammable.

Flammability / Explosive limit : no data available

Autoignition temperature : Not applicable

Vapor pressure : no data available

Vapor density : no data available

Density : 1.21 - 1.29 g/cm³ (68 °F (20 °C))

Solubility : Water solubility:
completely miscible

Solubility in other solvents:
not determined

Partition coefficient: n-octanol/water : log Pow: -9.8
THPS 75%, Structure-activity relationship (SAR), estimated

log Pow: -4.38
Polymer, Structure-activity relationship (SAR), estimated

Thermal decomposition : > 320 °F (160 °C)
Viscosity: Viscosity, kinematic: 4 mm²/s (73 °F (23 °C))
Explosive properties: no data available
Oxidizing properties: Not considered as oxidizing.

9.2 Other information
Molecular weight: 406.3 g/mol

SECTION 10: Stability and reactivity

10.1 Reactivity
Reactivity: Stable at normal ambient temperature and pressure.

10.2 Chemical stability
Chemical stability: Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No decomposition if stored and applied as directed.
Polymerization: Hazardous polymerization does not occur.

10.4 Conditions to avoid
Conditions to avoid: No dangerous reaction known under conditions of normal use.

10.5 Incompatible materials
Materials to avoid: Strong acids
                     Strong bases
                     Strong oxidizing agents
                     Strong reducing agents.

10.6 Hazardous decomposition products
Decomposition products: Oxides of phosphorus
                       Sulfur oxides
                       Hydrogen
                       Carbon monoxide, carbon dioxide and unburned hydrocarbons (smoke).
                       PHOSPHINE
SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Acute oral toxicity: The product itself has not been tested. According to the data on the components. According to the classification criteria for mixtures. Harmful if swallowed.

LD₅₀: 575 mg/kg - Rat, for males and females
THPS 75%
Unpublished internal reports

LD₅₀: > 2,000 mg/kg - Rat
Polymer
Unpublished internal reports

Acute inhalation toxicity: The product itself has not been tested. Data available only for some components. According to the classification criteria for mixtures. Toxic by inhalation.

LC₅₀ - 4 h (dust/mist): 0.59 mg/l - Rat, for males and females
THPS 75%
Published data

Acute dermal toxicity: The product itself has not been tested. Data available only for some components. According to the classification criteria for mixtures. Not classified as harmful by contact with skin

LD₅₀: > 2,000 mg/kg - Rat, for males and females
THPS 75%
Unpublished internal reports

Acute toxicity (other routes of administration): no data available
Skin corrosion/irritation
Skin irritation

: The product itself has not been tested.
According to the data on the components
According to the classification criteria for mixtures.
Not classified as irritating to skin

Rabbit
No skin irritation
Method: OECD Test Guideline 404
THPS 75%
Unpublished internal reports

Rabbit
Method: OECD Test Guideline 404
Unpublished internal reports
Polymer
Not classified as irritating to skin

Serious eye damage/eye irritation
Eye irritation

: The product itself has not been tested.
According to the data on the components
According to the classification criteria for mixtures.
Risk of serious damage to eyes.

Rabbit
Risk of serious damage to eyes.
Method: OECD Test Guideline 405
THPS 75%
Unpublished internal reports

Rabbit
Method: OECD Test Guideline 405
Polymer
Not classified as irritating to eyes
Unpublished internal reports

Respiratory or skin sensitization
Sensitization

: Magnusson and Kligman method - Guinea pig
May cause sensitization by skin contact.
THPS 75%
Unpublished internal reports

Magnusson and Kligman method - Guinea pig
Polymer
not sensitizing
Unpublished internal reports
Mutagenicity

Genotoxicity in vitro:

- Mutagenicity (Salmonella typhimurium - reverse mutation assay)
  - with and without metabolic activation
  - negative
  - THPS 75%
  - Unpublished internal reports

- Mutagenicity (in vitro mammalian cytogenetic test)
  - Strain: CHO
  - with and without metabolic activation
  - positive
  - THPS 75%
  - Unpublished internal reports

- UDS test
  - Strain: Hepatocyte (primary culture)
  - negative
  - THPS 75%
  - Unpublished internal reports

- Mouse lymphoma test / TK
  - with and without metabolic activation
  - positive
  - THPS 75%
  - Unpublished internal reports

- Mutagenicity (Escherichia coli - reverse mutation assay)
  - with and without metabolic activation
  - negative
  - Polymer
  - Unpublished internal reports

Genotoxicity in vivo:

- Data available only for some components.
- Product is not considered to be genotoxic

- Rodent dominant Lethal test - Rat
  - negative
  - THPS 75%
  - Unpublished internal reports

- In vivo micronucleus test - Mouse
  - negative
  - THPS 75%
  - Unpublished internal reports
Carcinogenicity

Carcinogenicity : Data available only for some components.

Rat Oral exposure
THPS 75%
Animal testing did not show any carcinogenic effects.
Published data

Mouse Oral exposure
THPS 75%
Animal testing did not show any carcinogenic effects.
Published data

This product does not contain any ingredient designated as probable or suspected human carcinogens by:
NTP
IARC
OSHA
ACGIH

Toxicity for reproduction and development

Toxicity to reproduction / fertility : Data available only for some components.

Fertility study 2 generations - Rat
Oral exposure
THPS 75%
no impairment of fertility has been observed
Unpublished internal reports

Developmental Toxicity/Teratogenicity : Data available only for some components.

Rat
Oral exposure
NOEL teratogenicity: 60 mg/kg
NOEL maternal: 15 mg/kg
THPS 75%
Unpublished internal reports

Rabbit
Oral exposure
NOEL teratogenicity: 18 mg/kg
NOEL maternal: 18 mg/kg
THPS 75%
Effects on development were observed
Unpublished internal reports

STOT

STOT-single exposure : Toxicology Assessment:
The substance or mixture is not classified as specific target organ toxicant, single exposure.

STOT-repeated exposure : Toxicology Assessment:
The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Data available only for some components.

Oral exposure 90 Days - Rat, for males and females
NOEL: 1 mg/kg
THPS 75%
Liver toxicity
Unpublished internal reports

Neurological effects
Neurological effects : THPS 75%, The product does not induce inhibition, Screening biochemistry test kit for cholinesterase activity inhibition

Carcinogenicity
Tetrakis(Hydroxymethyl) Phosphonium Sulfate : The product is not considered to be carcinogenic.

Teratogenicity
Tetrakis(Hydroxymethyl) Phosphonium Sulfate : Suspected human reproductive toxicant

Aspiration toxicity
Aspiration toxicity : no data available

SECTION 12: Ecological information

12.1 Toxicity

Aquatic Compartment
Acute toxicity to fish : LC50 - 96 h : 95 mg/l - Oncorhynchus mykiss (rainbow trout)
THPS 75%
Unpublished internal reports

LC50 - 96 h : 87 mg/l - Pleuronectes platessa (European Plaice)
THPS 75%
Unpublished internal reports
Acute toxicity to daphnia and other aquatic invertebrates.

- EC50 - 48 h : 15.1 mg/l - Daphnia magna (Water flea)
  THPS 75%
  Unpublished internal reports

- EC50 - 48 h : 17 mg/l - Daphnia magna (Water flea)
  Polymer
  Harmful to aquatic organisms.
  Test results are based on the dry product.
  Unpublished internal reports

- EC50 - 48 h : 0.4 mg/l - Crustacean: Acartia tonsa
  THPS 75%

- EC50 - 96 h : 1,000 mg/l - Crustacean: Americamysis bahia
  Polymer
  Unpublished internal reports

Toxicity to aquatic plants

- EC50 - 96 h : 0.66 mg/l - Pseudokirchneriella subcapitata (microalgae)
  THPS 75%
  Unpublished internal reports

- EC50 - 96 h : 0.16 mg/l - Skeletonema costatum (marine diatom)
  THPS 75%
  Unpublished internal reports

- NOEC - 96 h : 0.059 mg/l - Skeletonema costatum (marine diatom)
  THPS 75%
  Unpublished internal reports

Toxicity to microorganisms

- EC50 - 3 h : 24 mg/l - activated sludge
  THPS 75%
  Unpublished internal reports

- EC50 - 3 h : 2,200 mg/l - activated sludge
  Polymer
  Test results are based on the dry product.
  Unpublished internal reports

Chronic toxicity to fish

- NOEC: 1.1 mg/l - 32 d - Pimephales promelas (fathead minnow)
  THPS 75%
  Unpublished internal reports

Chronic toxicity to daphnia and other aquatic invertebrates.

- NOEC: 0.032 mg/l - 21 d - Daphnia magna (Water flea)
  Method: OECD Test Guideline 202
  THPS 75%
  Unpublished internal reports
Sediment compartment
Toxicity to benthic organisms
Tetrakis(Hydroxymethyl) Phosphonium Sulfate: EC50: 619 Exposure duration: 5 Days
Unpublished internal reports

Terrestrial Compartment
Toxicity to soil dwelling organisms
Tetrakis(Hydroxymethyl) Phosphonium Sulfate: LC50: 960 mg/kg - 14 Days - Eisenia fetida (earthworms)
Method: OECD Test Guideline 207

Toxicity to terrestrial plants
Tetrakis(Hydroxymethyl) Phosphonium Sulfate: EC50: 102 mg/kg - 14 Days
Method: OECD Test Guideline 208

Ecotoxicity assessment
Acute aquatic toxicity: According to the classification criteria for mixtures.
Very toxic to aquatic life.

Chronic aquatic toxicity: Toxic to aquatic life with long lasting effects.

M-Factor
Tetrakis(Hydroxymethyl) Phosphonium Sulfate: Acute aquatic toxicity = 1
(according to the Globally Harmonized System (GHS))

12.2 Persistence and degradability

Biodegradability
Biodegradability: Ultimate aerobic biodegradability
Method: Simulation study
70 % - 21 d
Readily biodegradable.
THPS 75%
US EPA FIFRA, Subdivision N, § 162-4
Unpublished internal reports

Ultimate aerobic biodegradability
Not readily biodegradable.
Polymer
Unpublished internal reports

anaerobic
Method: Simulation study
60 % - 30 d
THPS 75%
US EPA FIFRA, Subdivision N, § 162-3
Unpublished internal reports

Product is not persistent.
Stability
Stability in water
Tetrakis(Hydroxymethyl) Phosphonium Sulfate

DT50: Half-life value: 131 Days (77 °F (25 °C))
PH: 5.0
Method: according to a standardized method
Unpublished internal reports

DT50: Half-life value: 72 Days (77 °F (25 °C))
PH: 7.0
Method: according to a standardized method
Unpublished internal reports

DT50: Half-life value: 7 Days (77 °F (25 °C))
PH: 9.0
Method: according to a standardized method
Unpublished internal reports

Photodegradation
Tetrakis(Hydroxymethyl) Phosphonium Sulfate

Sensitizer: OH
Concentration sensitizer in molecule/cm3: 1,500,000 1/cm3
Rate constant in cm3 / molecule*s: 2.7E-11 cm3/s
Half-life indirect photolysis: 0.4 Days
Structure-activity relationship (SAR)
Published data

Other Physicochemical reactions
THPS 75%
Product is easily oxidizable in aqueous media in dilute solutions

Degradability assessment
Degradability assessment
Tetrakis(Hydroxymethyl) Phosphonium Sulfate
The product is considered to be rapidly degradable in the environment

12.3 Bioaccumulative potential
Partition coefficient: n-octanol/water
According to the data on the components
Not potentially bioaccumulable
Structure-activity relationship (SAR)

12.4 Mobility in soil
Adsorption potential (Koc)
Log Koc: 2.2
THPS 75%
Moderately mobile in soils
Unpublished internal reports

Known distribution to environmental compartments
Ultimate destination of the product: Water

12.5 Results of PBT and vPvB assessment
Results of PBT and vPvB assessment
This mixture contains no substance considered to be persistent, bioaccumulating, and toxic (PBT),. This mixture contains no substance considered to be very persistent and very bioaccumulating (vPvB).
12.6 Other adverse effects
Environment assessment: According to the classification criteria for mixtures.
Very toxic to aquatic life.
Toxic to aquatic life with long lasting effects.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product Disposal
Advice on Disposal: 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.

Waste Code: EPA:
Hazardous Waste – NO

Advice on cleaning and disposal of packaging
Advice: Take preliminary precautions based on the dangerous properties of the product.
Empty the packaging completely prior to disposal.
Empty containers should be taken to an approved waste handling site for recycling or disposal.
The user's attention is drawn to the possible existence of local regulations regarding disposal.

SECTION 14: Transport information

Transportation status: IMPORTANT! Statements below provide additional data on listed transport classification.
The listed Transportation Classification does not address regulatory variations due to changes in package size, mode of shipment or other regulatory descriptors.

DOT

14.1 UN number: UN 2810

14.2 Dangerous Good Description: UN 2810 TOXIC, LIQUIDS, ORGANIC, N.O.S. (tetrakis(hydroxymethyl) phosphonium sulphate), 6.1, III

14.3 Transport hazard class: 6.1

14.4 Packing group
Packing group: III
Label(s): 6.1
ERG No: 153
14.5 Environmental hazards
Marine pollutant
YES
Marine Pollutant (tetrakis(hydroxymethyl) phosphonium sulphate)

TDG

14.1 UN number
UN 2810

14.2 Dangerous Good Description
UN 2810 TOXIC LIQUID, ORGANIC, N.O.S. (tetrakis(hydroxymethyl) phosphonium sulphate), 6.1, III

14.3 Transport hazard class
6.1

14.4 Packing group
Packing group III
Label(s) 6.1
ERG No 153

14.5 Environmental hazards
Marine pollutant
YES
Marine Pollutant (tetrakis(hydroxymethyl) phosphonium sulphate)

IMDG

14.1 UN number
UN 2810

14.2 Dangerous Good Description
UN 2810 TOXIC LIQUID, ORGANIC, N.O.S. (tetrakis(hydroxymethyl) phosphonium sulphate), 6.1, III

14.3 Transport hazard class
6.1

14.4 Packing group
Packing group III
Label(s) 6.1
EmS F-A , S-A

14.5 Environmental hazards
Marine pollutant
YES

14.6 Special precautions for user
For personal protection see section 8.

IATA

14.1 UN number
UN 2810

14.2 Dangerous Good Description
UN 2810 TOXIC LIQUID, ORGANIC, N.O.S. (tetrakis(hydroxymethyl) phosphonium sulphate), 6.1, III
14.3 Transport hazard class
6.1

14.4 Packing group
Packing group III
Label(s): 6.1
Packing instruction (cargo aircraft) 663
Max net qty / pkg 220.00 L
Packing instruction (passenger aircraft) 655
Max net qty / pkg 60.00 L

14.5 Environmental hazards
Marine pollutant YES

14.6 Special precautions for user
For personal protection see section 8.

Note: The above regulatory prescriptions are those valid on the date of publication of this sheet. Given the possible evolution of transportation regulations for hazardous materials, it would be advisable to check their validity with your sales office.

SECTION 15: Regulatory information

15.1 Notification status
United States TSCA Inventory: e (special case)
This product is regulated under the United States Federal Insecticide, Fungicide and Rodenticide Act (FIFRA).

Canadian Domestic Substances List (DSL): YES (positive listing)
All components of this product are on the Canadian DSL.

Australia Inventory of Chemical Substances (AICS): n (Negative listing)
Not in compliance with the inventory

Japan. CSCL - Inventory of Existing and New Chemical Substances: n (Negative listing)
Not in compliance with the inventory

Korea. Korean Existing Chemicals Inventory (KECI): n (Negative listing)
Not in compliance with the inventory

China. Inventory of Existing Chemical Substances in China (IECSC): n (Negative listing)
Not in compliance with the inventory

15.2 Federal Regulations
**SARA 311/312 Hazards**

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Yes/No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire Hazard</td>
<td>no</td>
</tr>
<tr>
<td>Reactivity Hazard</td>
<td>no</td>
</tr>
<tr>
<td>Sudden Release of Pressure Hazard</td>
<td>no</td>
</tr>
<tr>
<td>Acute Health Hazard</td>
<td>yes</td>
</tr>
<tr>
<td>Chronic Health Hazard</td>
<td>yes</td>
</tr>
</tbody>
</table>

**SARA 313**

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

**SARA 302**

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

**EPCRA - Emergency Planning and Community Right-to-Know**

**CERCLA Reportable Quantity**

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>CAS-No.</th>
<th>Reportable quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td>50-00-0</td>
<td>100 lb</td>
</tr>
<tr>
<td>Acrylic Acid</td>
<td>79-10-7</td>
<td>5000 lb</td>
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</tbody>
</table>

**SARA 304 Reportable Quantity**

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>CAS-No.</th>
<th>Reportable quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td>50-00-0</td>
<td>100 lb</td>
</tr>
</tbody>
</table>

**SARA 302 Reportable Quantity**

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>CAS-No.</th>
<th>Reportable quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td>50-00-0</td>
<td>100 lb</td>
</tr>
</tbody>
</table>

**15.3 State Regulations**

**California Prop 65**

WARNING! This product contains a chemical known in the State of California to cause cancer.

Formaldehyde

No Significant Risk Levels (NSRLs) have been established for the following:

Formaldehyde

Value: 40 micrograms per day

**SECTION 16: Other information**

**NFPA (National Fire Protection Association) - Classification**

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>2 moderate</td>
</tr>
<tr>
<td>Flammability</td>
<td>0 minimal</td>
</tr>
<tr>
<td>Instability or Reactivity</td>
<td>1 slight</td>
</tr>
</tbody>
</table>
HMIS (Hazardous Materials Identification System (Paint & Coating)) - Classification

Health : 2 moderate
Flammability : 0 minimal
Reactivity : 1 slight

Further information
Date Prepared : 02/24/2015
Further information : Product classified under the US GHS format.

Key or legend to abbreviations and acronyms used in the safety data sheet

TWA : 8-hour, time-weighted average
ACGIH : American Conference of Governmental Industrial Hygienists
OSHA : Occupational Safety and Health Administration
WHMIS : Workplace Hazardous Materials Information System
NTP : National Toxicology Program
IARC : International Agency for Research on Cancer
NIOSH : National Institute for Occupational Safety and Health
NFPA : National Fire Protection Association
HMIS : Hazardous Materials Identification System (Paint & Coating)

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information, and belief at the date of its publication. Such information is only given as a guidance to help the user handle, use, process, store, transport, dispose, and release the product in satisfactory safety conditions and is not to be considered as a warranty or quality specification. It should be used in conjunction with technical sheets but do not replace them. Thus, the information only relates to the designated specific product and may not be applicable if such product is used in combination with other materials or in another manufacturing process, unless otherwise specifically indicated. It does not release the user from ensuring he is in conformity with all regulations linked to its activity.