# 1. PRODUCT AND COMPANY IDENTIFICATION

<table>
<thead>
<tr>
<th>Company Information</th>
<th>Contact Information</th>
<th>Phone Number</th>
<th>Available Hrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>UPI</td>
<td>Customer Service</td>
<td>1-800-438-6071</td>
<td>8:00 am to 5:00 pm EST</td>
</tr>
<tr>
<td></td>
<td>R&amp;D Technical Service</td>
<td>610-878-6100</td>
<td>8:00 am - 5:00 pm (EST)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Hydrothol® 191 Aquatic algicide and herbicide</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPA Reg #</td>
<td>70506-175</td>
</tr>
<tr>
<td>Recommended Use</td>
<td>Aquatic herbicide algicide</td>
</tr>
<tr>
<td>Product Code</td>
<td>12-174</td>
</tr>
</tbody>
</table>

**Product Name**: Hydrothol® 191 Aquatic algicide and herbicide

**EPA Reg #**: 70506-175

**Recommended Use**: Aquatic herbicide algicide

**Product Code**: 12-174
2. HAZARDS IDENTIFICATION

Emergency Overview
Causes irreversible eye damage
May be fatal if swallowed.
May be fatal if absorbed through skin
Harmful by inhalation
Causes severe skin irritation

DANGER!

Potential Health Effects
- Inhalation
- Skin contact
  Eyes Risk of serious damage to eyes. Causes irreversible eye damage.
  Skin Severely irritating to the skin. Prolonged contact can result in redness and blistering of skin.
  Inhalation Slightly toxic if inhaled.
  Ingestion Toxic if swallowed.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients Name

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS-No</th>
<th>Weight %</th>
<th>OSHA PEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mono(N,N-diethylalkylamine)salt of endothall</td>
<td>66330-88-9</td>
<td>53</td>
<td>N/A</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

Eye Contact
Hold eye open and rinse slowly and gently with water for 15 - 20 minutes. Remove contact lenses, if present, after 5 minutes, then continue rinsing eye.
Call a poison control center or doctor for treatment advice.

Skin Contact
Take off contaminated clothing.
Rinse skin immediately with plenty of water for 15-20 minutes.
Call poison control center or doctor for treatment advice.

Inhalation
Move person to fresh air.
If person is not breathing, call 911 or an ambulance, then give artificial respiration.
Call a poison control center or doctor for further treatment advice.

Ingestion
Call a physician or Poison Control Center immediately
Have person sip a glass of water if able to swallow
Do not induce vomiting unless told to do so by a poison control center or doctor
Never give anything by mouth to an unconscious person
5. FIRE-FIGHTING MEASURES

Flammable Explosive Properties

Flash Point  
> 100°C

Autoignition Temperature  
Not available

Flammability Limits in Air  
Not available

Extinguishing Media

Use: Water spray, Carbon dioxide (CO2), Foam, Dry chemical.

Fire/Explosion Hazard

Firefighters and others who may be exposed to products of combustion should wear full fire fighting turn out gear and self-contained breathing apparatus. Fire fighting equipment should be thoroughly decontaminated after use.

Hazardous Combustion Products

Extreme temperatures convert Endothall product to endothall anhydride which is a strong vesicant causing blistering of eyes, mucous membranes and skin.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions

Avoid contact with skin, eyes and clothing. Use personal protective equipment.

Environmental Precautions

Consult a regulatory specialist to determine appropriate state or local reporting requirements, for assistance in waste characterization and/or hazardous waste disposal and other requirements listed in pertinent environmental permits.. Do not flush into surface water or sanitary sewer system.

Methods for Clean-up

Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Sweep up and shovel into suitable containers for disposal.

7. HANDLING AND STORAGE

Handling

Keep out of reach of children. Empty containers may contain hazardous residues. Avoid contact with skin, eyes and clothing. Remove and wash contaminated clothing before re-use. Do not eat, drink or smoke when using this product. Wash thoroughly after handling.

Storage

Keep from freezing.
### 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

**Exposure Guidelines**
This product does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

**Engineering Controls**
Investigate engineering techniques to reduce exposures. Local mechanical exhaust ventilation is preferred. Consult ACGIH ventilation manual or NFPA Standard 91 for design of exhaust systems.

**Personal Protective Equipment**

<table>
<thead>
<tr>
<th>Type</th>
<th>Equipment</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye/face Protection</td>
<td>Goggles, Face-shield</td>
<td>Avoid contact with eyes.</td>
</tr>
<tr>
<td></td>
<td>Chemical resistant gloves</td>
<td>waterproof gloves.</td>
</tr>
<tr>
<td></td>
<td>Long sleeved clothing.</td>
<td>Long pants.</td>
</tr>
<tr>
<td>Skin Protection</td>
<td>Where airborne exposure</td>
<td>is likely, use NIOSH approved respiratory protection equipment</td>
</tr>
<tr>
<td></td>
<td>appropriate to the material</td>
<td>and/or its components. Full facepiece equipment is recommended</td>
</tr>
<tr>
<td></td>
<td>and, if used, replaces</td>
<td>need for face shield and/or chemical goggles. If exposures cannot</td>
</tr>
<tr>
<td></td>
<td>for face shield and/or</td>
<td>be kept at a minimum with engineering controls, consult respirator</td>
</tr>
<tr>
<td></td>
<td>chemical goggles.</td>
<td>manufacturer to determine appropriate type equipment for given</td>
</tr>
<tr>
<td></td>
<td></td>
<td>application. Observe respirator use limitations specified by</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NIOSH or the manufacturer.</td>
</tr>
<tr>
<td>Respiratory Protection</td>
<td>Where airborne exposure</td>
<td>is likely, use NIOSH approved respiratory protection equipment</td>
</tr>
<tr>
<td></td>
<td>is likely, use NIOSH</td>
<td>appropriate to the material and/or its components. Full facepiece</td>
</tr>
<tr>
<td></td>
<td>approved respiratory</td>
<td>equipment is recommended and, if used, replaces need for face shield</td>
</tr>
<tr>
<td></td>
<td>protection equipment</td>
<td>and/or chemical goggles. If exposures cannot be kept at a minimum</td>
</tr>
<tr>
<td></td>
<td>appropriate for given</td>
<td>with engineering controls, consult respirator manufacturer to</td>
</tr>
<tr>
<td></td>
<td>application. Observe</td>
<td>determine appropriate type equipment for given application. Observe</td>
</tr>
<tr>
<td></td>
<td>respirator use limitations</td>
<td>respirator use limitations specified by NIOSH or the manufacturer.</td>
</tr>
<tr>
<td></td>
<td>specified by NIOSH or the</td>
<td>For emergency and other conditions where there may be a potential</td>
</tr>
<tr>
<td></td>
<td>manufacturer.</td>
<td>for significant exposure, use an approved full face positive-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>pressure, self-contained breathing apparatus. Respiratory protection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>programs must comply with 29 CFR 1910.134. Mixers &amp; loaders: A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NIOSH approved dust mist filtering respirator with MSA/NIOSH approval</td>
</tr>
<tr>
<td></td>
<td></td>
<td>number prefix TC-21C or a NIOSH approved respirator with any N, R,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P, or HE filter.</td>
</tr>
</tbody>
</table>

**General Hygiene Considerations**
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product. Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing before re-use.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Dark yellow Light brown</td>
<td></td>
</tr>
<tr>
<td>Physical State</td>
<td>Liquid</td>
<td></td>
</tr>
<tr>
<td>Boiling Point/Range</td>
<td>100°C</td>
<td></td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.044 @25 C</td>
<td></td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>Not available</td>
<td></td>
</tr>
<tr>
<td>Vapor Density</td>
<td>Not available</td>
<td></td>
</tr>
<tr>
<td>Viscosity</td>
<td>100 cps @ 25 C</td>
<td></td>
</tr>
<tr>
<td>Bulk Density</td>
<td>No data available</td>
<td></td>
</tr>
<tr>
<td>Percent Volatiles</td>
<td>47%</td>
<td></td>
</tr>
<tr>
<td>Odor</td>
<td>Slight chlorine</td>
<td></td>
</tr>
<tr>
<td>pH</td>
<td>No data available</td>
<td></td>
</tr>
<tr>
<td>Melting Point/Range</td>
<td>Not available</td>
<td></td>
</tr>
<tr>
<td>Solubility</td>
<td>&gt;50 g/100 ml</td>
<td></td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>9.45 X 10-6 Torr(Salt)</td>
<td></td>
</tr>
<tr>
<td>VOC Content</td>
<td>Not available</td>
<td></td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>No data available</td>
<td></td>
</tr>
<tr>
<td>Percent Solids</td>
<td>Not available</td>
<td></td>
</tr>
<tr>
<td>pH</td>
<td>No data available</td>
<td></td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not available</td>
<td></td>
</tr>
<tr>
<td>Bulk Density</td>
<td>No data available</td>
<td></td>
</tr>
<tr>
<td>Percent Volatiles</td>
<td>47%</td>
<td></td>
</tr>
</tbody>
</table>

### 10. STABILITY AND REACTIVITY

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stability</td>
<td>Stable under normal</td>
<td></td>
</tr>
<tr>
<td>conditions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conditions to Avoid</td>
<td>Extreme temperatures.</td>
<td></td>
</tr>
<tr>
<td>Incompatible Materials</td>
<td>No materials to be</td>
<td></td>
</tr>
<tr>
<td></td>
<td>especially mentioned</td>
<td></td>
</tr>
<tr>
<td>Hazardous Decomposition</td>
<td>Extreme temperatures may</td>
<td></td>
</tr>
<tr>
<td>Products</td>
<td>convert endothall product</td>
<td></td>
</tr>
<tr>
<td></td>
<td>to endothall anhydride, a</td>
<td></td>
</tr>
<tr>
<td></td>
<td>strong vesicant, causing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>blistering of eyes, mucous</td>
<td></td>
</tr>
<tr>
<td></td>
<td>membranes and skin.</td>
<td></td>
</tr>
<tr>
<td>Possibility of Hazardous</td>
<td>Hazardous polymerisation</td>
<td></td>
</tr>
<tr>
<td>Polymerization</td>
<td>does not occur</td>
<td></td>
</tr>
</tbody>
</table>
11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Product Information

Single exposure studies indicate:
Oral - Moderately toxic to rats (LD50 233.4 mg/kg)
Dermal - Moderately toxic to rabbits (LD50 480.9 mg/kg)
Inhalation - Slightly toxic to rats (4 hr LC 50 0.7 mg/l)
Skin irritation - Severely irritating to rabbits
Eye irritation - severely irritating to rabbits
No skin allergy was observed in guinea pigs following repeated exposure.

Endothall
Intentional swallowing of 40 ml led to death within 12 hours. Skin allergy was observed in guinea pigs following repeated exposure. Repeated dietary administration (Via gelatin capsules) produced vomiting, diarrhea, sluggish movements, and liver, kidney and blood effects in dogs. Long-term dietary administration to rats and mice produced effects in the glandular stomach. High mortality rates and intestinal tumors considered to be secondary to the effects in the stomach were observed in mice. Long-term application to the skin of mice produced no tumors. No birth defects were observed in the offspring of rats exposed orally during pregnancy, even at dosages that produced adverse effects on the mothers. Skeletal abnormalities were observed in the offspring of rabbits and mice exposed during pregnancy, but only at dosages that produced adverse effects in the mothers. No genetic changes were observed in tests using bacteria, animal cells or animals.

Chronic Toxicity

There are no known carcinogenic chemicals in this product

Carcinogenicity
12. ECOLOGICAL INFORMATION

Ecotoxicity
Endothall Mono-Amine Salt Ecotoxicity

Acute Contact Toxicity Honey Bee (Apis mellifera) -
For endothall acid, mono-amine salt, and dipotassium salt
Practically non-toxic

Acute Toxicity Avian
Northern Bobwhite Quail (Colinus virginianus) LD50 = 736 mg/kg

Acute Toxicity Freshwater Fish (*static and **flow-thru)
*Bluegill sunfish (Lepomis macrochirus), EC50 = 0.94 ppm
*Rainbow trout (Oncorhynchus mykiss), EC50 = 0.56 ppm
**Rainbow trout (Oncorhynchus mykiss), EC50 = 0.94 ppm
*Cutthroat trout (Oncorhynchus clarki), EC50 = 0.18 ppm
*Channel catfish (Ictalurus punctatus), EC50 = 0.49 ppm
Fathead minnow (Pimephales promelas), EC50 = 0.75 ppm

Acute Toxicity Freshwater Invertebrates (*static)
*Waterflea (Daphnia magna), 48hr, EC50 = 0.36 ppm
*Grasshrimp (Palaemonetes kadiakensis), 96hr, EC50 = 0.05 ppm
*Scud (Gammarius lacustris), 48hr, EC50 = 2.0 ppm
*Scud (Gammarius lacustris), 96hr, EC50 = 0.5 ppm
*Giant salmonfly (Pteronarcyis californica), 48hr, EC50 = 3.25 ppm

Acute Toxicity Estuarine/Marine Fish (** Flow-thru)
**Sheepshead minnow (Cyprinodon variegatus), 96hr, EC50 = 3.5 ppm

Acute Toxicity Estuarine/Marine Invertebrates (** Flow-thru)
**Mysid shrimp (Mysidopsis bahia), 96hr, EC50 = 2.2 ppm
**Eastern oyster (Crassostrea virginica), shell deposition,
96hr, EC50 = 0.6 ppm

Chem Fate: Active ingredient (technical) -
No degradation was observed in irradiated or dark water during a 30-day test period at pH 7 or 9. Rapid degradation was observed in irradiated, but not dark, water at pH 5 (Half-life < 24 hours). This material adsorbed readily from aqueous solution on to Crosby silt loam. It is not expected to bioaccumulate with bioaccumulation factors (BCF) of 10 for mosquito fish and 0.003-0.008 for bluegills..

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method
Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide or rinsate is a violation of Federal law. If the wastes cannot be disposed of by use or according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.
Contaminated Packaging

Non refillable container. Do not reuse this container. Triple rinse or pressure rinse promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

Pressure rinse as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 PSI for at least 30 seconds. Drain for 10 seconds after the flow begins to drip. Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

14. TRANSPORT INFORMATION

DOT

Proper Shipping Name: Pesticides, liquid, toxic. n.o.s. (Endothal)
Hazard Class: 6.1
UN-No: 2902
Packing Group: PG III
Reportable Quantity (RQ): 1,000 lbs (endothall)

ICAO

UN-No: 2902
Proper Shipping Name: Pesticide, liquid, toxic, n.o.s. (Endothal)
Hazard Class: 6.1
Packing Group: PG III

IATA

UN-No: 2902
Proper Shipping Name: Pesticide, liquid, toxic, n.o.s. (Endothal)
Hazard Class: 6.1
Packing Group: PG III
ERG Code: 6 L

IMDG/IMO

Proper Shipping Name: Pesticide, liquid, toxic, n.o.s. (Endothal)
Hazard Class: 6.1
UN-No: 2902
Packing Group: PG III
EmS No.: F-A, S-A

15. REGULATORY INFORMATION

International Inventories
USA

Federal Regulations

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and and Title 40n of the Code of Federal Regulations, Part 372.

SARA 311/312 Hazardous Categorization
- Chronic Health Hazard: No
- Acute Health Hazard: Yes
- Fire Hazard: No
- Sudden Release of Pressure Hazard: No
- Reactive Hazard: No

Clean Water Act

Clean Air Act, Section 112 Hazardous Air Pollutants (HAPs) (see 40 CFR 61)
This product does not contain any HAPs.

CERCLA
RCRA

Pesticide Information

State Regulations
California Proposition 65
This product does not contain any Proposition 65 chemicals.

State Right-to-Know

International Regulations
- Mexico - Grade: Not available

Canada
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS Hazard Class
Not determined

16. OTHER INFORMATION

Revision Date 23-Dec-2010

Revision Summary
Update section 13 Update section 8
UPI, Inc. believes that the information and recommendations contained herein (including data and statements) are accurate as of the date hereof. NO WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE, WARRANTY OF MERCHANTABILITY, OR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, IS MADE CONCERNING THE INFORMATION PROVIDED HEREIN. The information provided herein relates only to the specific product designated and may not be valid where such product is used in combination with other materials or in any process. Further, since the conditions and methods of use are beyond the control of UPI, Inc. UPI, Inc. expressly disclaims any and all liability as to any results obtained or arising from any use of the product or reliance on such information.

End of MSDS