Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

MEGAPOSIT™ SPR™ 220-4.5 POSITIVE PHOTORESIST

Revision Date: 07/02/2013

Supplier
ROHM AND HAAS ELECTRONIC MATERIALS LLC
A Subsidiary of The Dow Chemical Company
455 FOREST STREET
MARLBOROUGH, MA 01752 United States

For non-emergency information contact: 215-592-3000

Emergency telephone number 1 800 424 9300
Local emergency telephone number 989-636-4400

®™*Trademark of The Dow Chemical Company (“Dow”) or an affiliated company of Dow

2. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cresol novolak resin</td>
<td>97-64-3</td>
<td>25.0 - 35.0 %</td>
</tr>
<tr>
<td>Ethyl lactate</td>
<td>100-66-3</td>
<td>25.0 - 35.0 %</td>
</tr>
<tr>
<td>Anisole</td>
<td>123-91-1</td>
<td>&lt; 0.2 %</td>
</tr>
<tr>
<td>Diazo Photoactive Compound</td>
<td>100-66-3</td>
<td>10.0 - 20.0 %</td>
</tr>
<tr>
<td>2-Methyl Butyl Acetate</td>
<td>628-63-7</td>
<td>&lt; 1.0 %</td>
</tr>
<tr>
<td>n-amyl acetate</td>
<td>624-41-9</td>
<td>1.0 - 10.0 %</td>
</tr>
<tr>
<td>Cresol</td>
<td>1319-77-3</td>
<td>&lt; 1.0 %</td>
</tr>
<tr>
<td>Organic Siloxane Surfactant</td>
<td>123-91-1</td>
<td>&lt; 0.2 %</td>
</tr>
<tr>
<td>Dioxane</td>
<td>1319-77-3</td>
<td>&lt; 1.0 %</td>
</tr>
</tbody>
</table>

3. HAZARDS IDENTIFICATION

Emergency Overview

Appearance

Form liquid
Colour: Red Amber
Odour: ester-like

<table>
<thead>
<tr>
<th>Hazard Summary</th>
<th>CAUTION!</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combustible liquid and vapor. Causes irritation to eyes, nose, and respiratory tract. Prolonged, repeated contact, inhalation, ingestion, or absorption through the skin, may cause adverse effects to internal organ systems.</td>
<td></td>
</tr>
</tbody>
</table>

Potential Health Effects
Primary Routes of Entry: Inhalation, ingestion, eye and skin contact, absorption.

Eyes: May cause pain, transient irritation and superficial corneal effects.

Skin: Material may cause irritation. Prolonged or repeated exposure may have the following effects:
central nervous system depression
drowsiness
defatting of skin leading to irritation and dermatitis

Ingestion: Swallowing may have the following effects:
irritation of mouth, throat and digestive tract
Repeated doses may have the following effects:
central nervous system depression
drowsiness

Inhalation: Inhalation may have the following effects: irritation of nose, throat and respiratory tract Higher concentrations may have the following effects: systemic effects similar to those resulting from ingestion

Target Organs: Eye
Respiratory System
Skin
nervous system

Carcinogenicity

Not considered carcinogenic by NTP, IARC, and OSHA

4. FIRST AID MEASURES

Inhalation: Remove from exposure. If there is difficulty in breathing, give oxygen. Seek medical attention if symptoms persist.

Skin contact: Wash skin with water. Continue washing for at least 15 minutes. Obtain medical attention if blistering occurs or redness persists.
Eye contact: Immediately flush the eye with plenty of water for at least 15 minutes, holding the eye open. Obtain medical attention if soreness or redness persists.

Ingestion: Wash out mouth with water. Have victim drink 1-3 glasses of water to dilute stomach contents. Induce vomiting if person is conscious. Immediate medical attention is required. Never administer anything by mouth if a victim is losing consciousness, is unconscious or is convulsing.

Notes to physician: Treat symptomatically.

5. FIREFIGHTING MEASURES

Flash point  45 °C (113 °F)
Ignition temperature ca.400.0 °C (752 °F) Literature Ethyl lactate
Lower explosion limit 0.34 % vol Literature Anisole
Upper explosion limit 6.3 % vol Literature Anisole

Suitable extinguishing media: Use water spray, foam, dry chemical or carbon dioxide. Keep containers and surroundings cool with water spray.

Specific hazards during firefighting: This product may give rise to hazardous vapors in a fire. Vapors can travel a considerable distance to a source of ignition and result in flashback.

Special protective equipment for firefighters: Wear full protective clothing and self-contained breathing apparatus.

Further information: Pressure may build up in closed containers with possible liberation of combustible vapors.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Wear suitable protective clothing.
Wear respiratory protection.
Eliminate all ignition sources.

Environmental precautions
Prevent the material from entering drains or water courses.
Do not discharge directly to a water source.
Advise Authorities if spillage has entered watercourse or sewer or has contaminated soil or vegetation.

Methods for cleaning up
Contain spills immediately with inert materials (e.g., sand, earth).
Transfer into suitable containers for recovery or disposal.
Finally flush area with plenty of water.
7. HANDLING AND STORAGE

Handling
Use local exhaust ventilation. Avoid contact with eyes, skin and clothing. Keep container tightly closed.

Storage
Storage conditions: Store in original container. Keep away from heat and sources of ignition. Storage area should be: cool dry well ventilated out of direct sunlight
Further information on storage conditions: Keep away from heat, sparks, flame, and other sources of ignition. Practice good personal hygiene to prevent accidental exposure.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limit(s)

Exposure limits are listed below, if they exist.

<table>
<thead>
<tr>
<th>Component</th>
<th>Regulation</th>
<th>Type of listing</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethyl lactate</td>
<td>Rohm and Haas</td>
<td>TWA</td>
<td>5 ppm</td>
</tr>
<tr>
<td>Anisole</td>
<td>Rohm and Haas</td>
<td>TWA</td>
<td>5 ppm</td>
</tr>
<tr>
<td>Anisole</td>
<td>Rohm and Haas</td>
<td>STEL</td>
<td>10 ppm</td>
</tr>
<tr>
<td>2-Methyl Butyl Acetate</td>
<td>Rohm and Haas</td>
<td>TWA</td>
<td>50 ppm</td>
</tr>
<tr>
<td>2-Methyl Butyl Acetate</td>
<td>Rohm and Haas</td>
<td>TWA</td>
<td>50 ppm</td>
</tr>
<tr>
<td>2-Methyl Butyl Acetate</td>
<td>Rohm and Haas</td>
<td>STEL</td>
<td>100 ppm</td>
</tr>
<tr>
<td>n-amyl acetate</td>
<td>Rohm and Haas</td>
<td>TWA</td>
<td>50 ppm</td>
</tr>
<tr>
<td>n-amyl acetate</td>
<td>Rohm and Haas</td>
<td>STEL</td>
<td>100 ppm</td>
</tr>
<tr>
<td>n-amyl acetate</td>
<td>OSHA P1</td>
<td>TWA</td>
<td>525 mg/m3 100 ppm</td>
</tr>
<tr>
<td>n-amyl acetate</td>
<td>OSHA P0</td>
<td>TWA</td>
<td>525 mg/m3 100 ppm</td>
</tr>
<tr>
<td>n-amyl acetate</td>
<td>NIOSH REL</td>
<td>TWA</td>
<td>525 mg/m3 100 ppm</td>
</tr>
<tr>
<td>Cresol</td>
<td>OSHA P1</td>
<td>TWA</td>
<td>22 mg/m3 5 ppm</td>
</tr>
<tr>
<td>Cresol</td>
<td>OSHA P1</td>
<td>TWA</td>
<td>22 mg/m3 5 ppm</td>
</tr>
<tr>
<td>Cresol</td>
<td>OSHA P0</td>
<td>TWA</td>
<td>22 mg/m3 5 ppm</td>
</tr>
<tr>
<td>Cresol</td>
<td>ACGIH</td>
<td>TWA</td>
<td></td>
</tr>
<tr>
<td>Cresol</td>
<td>ACGIH</td>
<td>TWA</td>
<td></td>
</tr>
<tr>
<td>Cresol</td>
<td>ACGIH</td>
<td>TWA</td>
<td></td>
</tr>
<tr>
<td>Cresol</td>
<td>ACGIH</td>
<td>TWA</td>
<td></td>
</tr>
<tr>
<td>Cresol</td>
<td>ACGIH</td>
<td>TWA</td>
<td>20 mg/m3 1 ppm</td>
</tr>
<tr>
<td>Cresol</td>
<td>OSHA P0</td>
<td>TWA</td>
<td>22 mg/m3 5 ppm</td>
</tr>
<tr>
<td>Cresol</td>
<td>OSHA P0</td>
<td>TWA</td>
<td>22 mg/m3 5 ppm</td>
</tr>
<tr>
<td>Dioxane</td>
<td>Rohm and Haas</td>
<td>TWA</td>
<td>5 ppm</td>
</tr>
<tr>
<td>Dioxane</td>
<td>Rohm and Haas</td>
<td>Absorbed via skin</td>
<td></td>
</tr>
<tr>
<td>Dioxane</td>
<td>ACGIH</td>
<td>TWA</td>
<td>20 ppm</td>
</tr>
<tr>
<td>Dioxane</td>
<td>ACGIH</td>
<td>TWA</td>
<td></td>
</tr>
<tr>
<td>Dioxane</td>
<td>OSHA P1</td>
<td>TWA</td>
<td>360 mg/m3 100 ppm</td>
</tr>
<tr>
<td>Dioxane</td>
<td>OSHA P1</td>
<td>TWA</td>
<td></td>
</tr>
<tr>
<td>Dioxane</td>
<td>OSHA P0</td>
<td>TWA</td>
<td>90 mg/m3 25 ppm</td>
</tr>
<tr>
<td>Dioxane</td>
<td>NIOSH REL</td>
<td>C</td>
<td>3.6 mg/m3 1 ppm</td>
</tr>
</tbody>
</table>

Exposure controls
**Engineering measures:** Engineering methods to prevent or control exposure are preferred. Methods include process or personnel enclosure, mechanical ventilation (local exhaust), and control of process conditions.

**Individual protection measures**

**Eye/face protection:** Goggles

**Skin protection**

**Hand protection:** Butyl rubber gloves. Other chemical resistant gloves may be recommended by your safety professional.

**Other protection:** Normal work wear.

**Respiratory protection:** Respiratory protection if there is a risk of exposure to high vapor concentrations. The specific respirator selected must be based on the airborne concentration found in the workplace and must not exceed the working limits of the respirator.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form</td>
<td>liquid</td>
</tr>
<tr>
<td>Colour</td>
<td>Red Amber</td>
</tr>
<tr>
<td>Odour</td>
<td>ester-like</td>
</tr>
<tr>
<td>pH</td>
<td>7</td>
</tr>
<tr>
<td>Boiling point/boiling range</td>
<td>150 °C (302 °F)</td>
</tr>
<tr>
<td>Flash point</td>
<td>45 °C (113 °F)</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>Slower than ether</td>
</tr>
<tr>
<td>Lower explosion limit</td>
<td>0.34 % volLiterature Anisole</td>
</tr>
<tr>
<td>Upper explosion limit</td>
<td>6.3 % volLiterature Anisole</td>
</tr>
</tbody>
</table>

**Component:** Ethyl lactate

**Vapour pressure**

1.7 mmHg at 20 °C (68 °F)

**Component:** Anisole

**Vapour pressure**

9.7 mmHg at 42 °C (108 °F)

**Component:** Dioxane

**Vapour pressure**

27.0 mmHg at 20 °C (68 °F)

**Relative vapour density**

Heavier than air.

**Relative density**

1.07

**Water solubility**

insoluble

**Auto-ignition temperature**

ca.400 °C (752 °F) Literature Ethyl lactate

**VOC’s**

710.00 g/L
NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Chemical stability  Stable under normal conditions.

Hazardous reactions  No dangerous reaction known under conditions of normal use.

Conditions to avoid  High temperatures  Static discharge

Materials to avoid  Oxidizing agents  Bases  Acids

Hazardous decomposition products  Carbon monoxide, carbon dioxide, phenols, oxides of sulfur, nitrogen oxides (NOx),

polymerisation  Product will not undergo hazardous polymerization.

11. TOXICOLOGICAL INFORMATION

Toxicological information on this product or its components appear in this section when such data is available.

Component: Ethyl lactate
   Acute oral toxicity  LD50 rat  > 2,000 mg/kg OECD Test Guideline 425

Component: Anisole
   Acute oral toxicity  LD50 rat  3,700 mg/kg

Component: Diazoo Photoactive Compound
   Acute oral toxicity  Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts.

Component: 2-Methyl Butyl Acetate
   Acute oral toxicity  LD50 rat  12,306 mg/kg

Component: n-amyl acetate
   Acute oral toxicity  LD50 rat  > 1,600 mg/kg

Component: Cresol
   Acute oral toxicity  LD50 rat  100 - 300 mg/kg

Component: Dioxane
   Acute oral toxicity  LD50 rat  > 5,000 mg/kg

Component: Ethyl lactate
   Acute inhalation toxicity  LC0 rat  4 Hour 5.4 mg/l
Component: **Diazo Photoactive Compound**

**Acute inhalation toxicity**

No adverse effects are anticipated from single exposure to dust.

Component: **2-Methyl Butyl Acetate**

**Acute inhalation toxicity**

LC50 rat 4 Hour > 5.2 mg/l

Component: **n-amyl acetate**

**Acute inhalation toxicity**

16,000 mg/m3

Component: **n-amyl acetate**

**Acute inhalation toxicity**

no data available

Component: **Cresol**

**Acute inhalation toxicity**

LC50 rat 8 Hour 35.38 mg/l

Component: **Dioxane**

**Acute inhalation toxicity**

Prolonged excessive exposure may cause serious adverse effects, even death. May cause central nervous system effects. Excessive exposure may cause irritation to upper respiratory tract (nose and throat) and lungs. Symptoms of excessive exposure may be anesthetic or narcotic effects; dizziness and drowsiness may be observed. May cause pulmonary edema (fluid in the lungs.)

Component: **Dioxane**

**Acute inhalation toxicity**

LC50 rat 4 Hour 51.3 mg/l

Component: **Ethyl lactate**

**Acute dermal toxicity**

LD50 rat > 5,000 mg/kg

Component: **Anisole**

**Acute dermal toxicity**

The dermal LD50 has not been determined.

Component: **Diazo Photoactive Compound**

**Acute dermal toxicity**

Prolonged skin contact is unlikely to result in absorption of harmful amounts.

Component: **2-Methyl Butyl Acetate**

**Acute dermal toxicity**

LD50 rabbit 8,359 mg/kg

Component: **n-amyl acetate**

**Acute dermal toxicity**

LD50 rabbit > 17,500 mg/kg

Component: **Cresol**

**Acute dermal toxicity**

LD50 rabbit 213 - 426 mg/kg

Component: **Dioxane**

**Acute dermal toxicity**

LD50 rabbit > 7,000 mg/kg

Component: **Anisole**

**Skin irritation**

A single application to rabbit skin produced mild irritation.

Component: **Diazo Photoactive Compound**
Skin irritation  
No relevant data found.

Component: **2-Methyl Butyl Acetate**  
Skin irritation  
rabbit Moderate irritation.

Component: **n-amyl acetate**  
Skin irritation  
no data available

Component: **Cresol**  
Skin irritation  
rabbit Causes burns.

Component: **Dioxane**  
Skin irritation  
No skin irritation  
Brief contact is essentially nonirritating to skin.  
May cause drying and flaking of the skin.  
Prolonged contact may cause skin irritation with local redness.

Component: **Ethyl lactate**  
Eye irritation  
moderate to severe.  
Single application to the rabbit eye produced conjunctival irritation.

Component: **Diazo Photoactive Compound**  
Eye irritation  
No relevant data found.

Component: **2-Methyl Butyl Acetate**  
Eye irritation  
rabbit Moderate eye irritation

Component: **n-amyl acetate**  
Eye irritation  
slight irritation

Component: **Cresol**  
Eye irritation  
rabbit Corrosive

Component: **Dioxane**  
Eye irritation  
Eye irritation  
May cause slight eye irritation.  
May cause slight corneal injury.  
Vapor may cause eye irritation experienced as mild discomfort and redness.

Component: **Ethyl lactate**  
Sensitisation  
no data available

Component: **Diazo Photoactive Compound**  
Sensitisation  
No relevant data found.

Component: **Diazo Photoactive Compound**  
Sensitisation  
No relevant data found.

Component: **2-Methyl Butyl Acetate**  
Sensitisation  
HRIPT (human repeat insult patch test) human Not a sensitizer.

Component: **n-amyl acetate**
Sensitisation: no data available

Component: **Dioxane**
- Sensitisation: For skin sensitization: No relevant information found.
- Sensitisation: For respiratory sensitization: No relevant information found.

Component: **Ethyl lactate**
- Sensitisation: Carcinogenicity: no data available
- Sensitisation: Reproductive toxicity: no data available
- Sensitisation: Teratogenicity: Development effects were not observed in laboratory animals.
- Sensitisation: Mutagenicity: Reverse mutation test using bacteria: Non-mutagenic with and without metabolic activation

Component: **Diazo Photoactive Compound**
- Sensitisation: Subchronic toxicity: No relevant data found.

Component: **Diazo Photoactive Compound**
- Sensitisation: Carcinogenicity: No relevant data found.
- Sensitisation: Reproductive toxicity: No relevant data found.
- Sensitisation: Teratogenicity: No relevant data found.
- Sensitisation: Mutagenicity: No relevant data found.

Component: **2-Methyl Butyl Acetate**
- Sensitisation: Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects.
- Sensitisation: Subchronic toxicity: Inhalation rat NOAEL: 1,200 mg/kg none

Component: **n-amyl acetate**
- Sensitisation: Carcinogenicity: No data found
- Sensitisation: Reproductive toxicity: No data found
- Sensitisation: Exposure of pregnant rabbits to vapor at 1500 ppm resulted in maternal toxicity. The following effects were observed: decreased body weight. No adverse reproductive effects were observed in experimental animals.
Teratogenicity
No data found
Component: n-amyl acetate

Mutagenicity
Not mutagenic in Ames Test.

Component: Cresol

Teratogenicity
Developmental effects were seen in laboratory animals only at dose levels that were maternally toxic.
Component: Cresol

Mutagenicity
In vitro genetic toxicity studies were negative in some cases and positive in other cases. Animal genetic toxicity studies were negative.
Component: Dioxane

Subchronic toxicity
In animals, effects have been reported on the following organs:
Liver.
Kidney.
Nasal tissue.
May cause central nervous system effects.

Component: Dioxane

Carcinogenicity: Human epidemiology studies have shown no indication that exposures to 1,4-dioxane in industrial situations have caused an increased incidence of tumors even though it has been shown to cause cancer in some laboratory animals.

Component: Dioxane

Reproductive toxicity
Limited data in laboratory animals suggest that the material does not affect reproduction.

Component: Dioxane

Teratogenicity
Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Did not cause birth defects in laboratory animals.
Component: Dioxane

Mutagenicity
In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

12. ECOLOGICAL INFORMATION

Ecotoxicological information on this product or its components appear in this section when such data is available.

Ethyl lactate
Elimination information (persistence and degradability)
Biodegradability
OECD Test Guideline 302
75 %

Ecotoxicity effects
Toxicity to fish
LC50 Zebra fish (Danio/Brachydanio rerio) 96 Hour OECD Test Guideline 203 or Equivalent
320 mg/l
<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxicity to algae</td>
<td>ErC50 green alga <em>Pseudokirchneriella subcapitata</em> (formerly known as <em>Selenastrum capricornutum</em>) 96 Hour 3,500 mg/l</td>
</tr>
<tr>
<td>Toxicity to aquatic invertebrates</td>
<td>EC50 Daphnia magna (Water flea) 48 Hour 560 mg/l</td>
</tr>
<tr>
<td><strong>Anisole</strong></td>
<td></td>
</tr>
<tr>
<td>Ecotoxicity effects</td>
<td></td>
</tr>
<tr>
<td>Toxicity to algae</td>
<td>Growth rate EC50 <em>Pseudokirchneriella subcapitata</em> (green algae) 96 Hour 162 mg/l</td>
</tr>
<tr>
<td><strong>Diazophotoactive Compound</strong></td>
<td></td>
</tr>
<tr>
<td>Elimination information</td>
<td></td>
</tr>
<tr>
<td>(persistence and degradability)</td>
<td></td>
</tr>
<tr>
<td>Biodegradability</td>
<td>No relevant data found.</td>
</tr>
<tr>
<td>Bioaccumulation</td>
<td>No data available.</td>
</tr>
<tr>
<td>Ecotoxicity effects</td>
<td></td>
</tr>
<tr>
<td>Toxicity to fish</td>
<td></td>
</tr>
<tr>
<td>No relevant data found.</td>
<td></td>
</tr>
<tr>
<td><strong>2-Methyl Butyl Acetate</strong></td>
<td></td>
</tr>
<tr>
<td>Ecotoxicity effects</td>
<td></td>
</tr>
<tr>
<td>Toxicity to fish</td>
<td>LC50 Fathead minnow (<em>Pimephales promelas</em>) 96 Hour Method Not Specified 69 mg/l</td>
</tr>
<tr>
<td>Toxicity to algae</td>
<td>EC50 <em>Pseudokirchneriella subcapitata</em> 96 Hour &gt;466 mg/l</td>
</tr>
<tr>
<td>Toxicity to aquatic invertebrates</td>
<td>EC50 Daphnia magna 48 Hour OECD Test Guideline 202 or Equivalent 40.9 mg/l</td>
</tr>
<tr>
<td><strong>n-amyl acetate</strong></td>
<td></td>
</tr>
<tr>
<td>Ecotoxicity effects</td>
<td></td>
</tr>
<tr>
<td>Toxicity to fish</td>
<td>LC50 Mosquito fish (<em>Gambusia affinis</em>) 96 Hour 65 mg/l</td>
</tr>
<tr>
<td>Toxicity to fish</td>
<td>no data available</td>
</tr>
<tr>
<td>Toxicity to algae</td>
<td>EC50 Algae 24 Hour 550 mg/l</td>
</tr>
<tr>
<td>Toxicity to algae</td>
<td>no data available</td>
</tr>
<tr>
<td>Toxicity to aquatic invertebrates</td>
<td>EC50 Daphnia magna 24 Hour 210 mg/l</td>
</tr>
</tbody>
</table>
**Toxicity to aquatic invertebrates**
no data available

**Cresol**

**Ecotoxicity effects**

**Toxicity to fish**
LC50 Zebra fish (Danio/Brachydanio rerio) 96 Hour Method Not Specified
9 mg/l

**Toxicity to fish**
LC50 Bluegill sunfish (Lepomis macrochirus) 96 Hour Method Not Specified
10 mg/l

**Toxicity to fish**
LC50 Pimephales promelas (fathead minnow) 96 Hour Method Not Specified
12.8 mg/l

**Toxicity to bacteria**
EC0 Pseudomonas putida 0.5 Hour
250 mg/l

**Toxicity to aquatic invertebrates**
LC50 Daphnia 48 Hour Method Not Specified
33 - 100 mg/l

**Dioxane**

**Elimination information (persistence and degradability)**

**Biodegradability**
Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions.

**Biodegradability**
OECD Test Guideline 301C or Equivalent Not biodegradable.
29 %
10-day Window: Not applicable

**Bioaccumulation**
Cyprinus carpio (Carp) 42 d 25 °C
Concentration: 10 mg/l
Bioconcentration factor (BCF): 0.2 - 0.6

**Ecotoxicity effects**

**Toxicity to fish**
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

**Toxicity to fish**
static test LC50 Pimephales promelas (fathead minnow) 96 Hour OECD Test Guideline 203 or Equivalent
13,000 mg/l

**Toxicity to aquatic invertebrates**
static test EC50 Daphnia magna (Water flea) 24 Hour OECD Test Guideline 202 or Equivalent
8,450 mg/l

**Chemical Fate**
13. DISPOSAL CONSIDERATIONS

Environmental precautions: Prevent the material from entering drains or water courses. Do not discharge directly to a water source. Advise Authorities if spillage has entered watercourse or sewer or has contaminated soil or vegetation.

Disposal
Dispose in accordance with all local, state (provincial), and federal regulations. Incineration is the recommended method of disposal for containers. Under RCRA, it is the responsibility of the product’s user to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because the product uses, transformations, mixtures, processes, etc. may render the resulting materials hazardous. Do not remove label until container is thoroughly cleaned. Empty containers may contain hazardous residues. This material and its container must be disposed of in a safe way.

14. TRANSPORT INFORMATION

DOT

Not regulated per 49CFR 173.150(f)(2)

Classification for SEA transport (IMO-IMDG):

<table>
<thead>
<tr>
<th>Proper shipping name</th>
<th>RESIN SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN number</td>
<td>UN 1866</td>
</tr>
<tr>
<td>Class</td>
<td>3</td>
</tr>
<tr>
<td>Packing group</td>
<td>III</td>
</tr>
</tbody>
</table>

Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations.

15. REGULATORY INFORMATION

Workplace Classification

OSHA: Combustible
      Irritant
      Target organ effects

WHMIS: This product is a ‘controlled product’ under the Canadian Workplace Hazardous Materials Information System (WHMIS).

SARA TITLE III: Section 311/312 Categorizations (40CFR370): Immediate, delayed, flammability hazard
SARA TITLE III: Section 313 Information (40CFR372)
This product does not contain a chemical which is listed in Section 313 at or above de minimis concentrations.

United States TSCA Inventory (US.TSCA): All components of this product are in compliance with the inventory listing requirements of the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

California (Proposition 65)
This product does not contain materials which the State of California has found to cause cancer, birth defects or other reproductive harm.

16. OTHER INFORMATION

<table>
<thead>
<tr>
<th>NFPA Hazard Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
</tr>
<tr>
<td>2</td>
</tr>
</tbody>
</table>

Legend

<table>
<thead>
<tr>
<th>ACGIH</th>
<th>American Conference of Governmental Industrial Hygienists</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAc</td>
<td>Butyl acetate</td>
</tr>
<tr>
<td>OSHA</td>
<td>Occupational Safety and Health Administration</td>
</tr>
<tr>
<td>PEL</td>
<td>Permissible Exposure Limit</td>
</tr>
<tr>
<td>STEL</td>
<td>Short Term Exposure Limit (STEL):</td>
</tr>
<tr>
<td>TLV</td>
<td>Threshold Limit Value</td>
</tr>
<tr>
<td>TWA</td>
<td>Time Weighted Average (TWA):</td>
</tr>
</tbody>
</table>

| Bar denotes a revision from prior MSDS. |

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. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.