1. PRODUCT AND COMPANY IDENTIFICATION

MEGAPOSIT™ SPR™ 955CM-1.4 POSITIVE PHOTORESIST

Revision Date: 03/26/2013

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

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2. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethyl lactate</td>
<td>97-64-3</td>
<td>60.0 - 70.0 %</td>
</tr>
<tr>
<td>Cresol novolak resin</td>
<td>100-66-3</td>
<td>5.0 - 15.0 %</td>
</tr>
<tr>
<td>Anisole</td>
<td>100-66-3</td>
<td>5.0 - 15.0 %</td>
</tr>
<tr>
<td>Amyl acetate</td>
<td>628-63-7</td>
<td>1.0 - 5.0 %</td>
</tr>
<tr>
<td>Methyl butyl acetate</td>
<td>624-41-9</td>
<td>1.0 - 5.0 %</td>
</tr>
<tr>
<td>Diazo Photoactive Compound</td>
<td>1319-77-3</td>
<td>&lt; 1.0 %</td>
</tr>
<tr>
<td>Cresol</td>
<td>1319-77-3</td>
<td>&lt; 1.0 %</td>
</tr>
<tr>
<td>Organic Siloxane Surfactant</td>
<td>&lt;1.0 %</td>
<td></td>
</tr>
</tbody>
</table>

3. HAZARDS IDENTIFICATION

Emergency Overview

Appearance
Form liquid
Colour red
Odour
Sweet odor organic

**Hazard Summary**

**CAUTION!**

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.

**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

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**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  ca.44 °C (111 °F)
Ignition temperature  400.0 °C (752 °F) Literature
Lower explosion limit  1.5 % vol Literature
Upper explosion limit  11.4 % vol Literature

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.
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>Amyl acetate</td>
<td>Rohm and Haas</td>
<td>TWA</td>
<td>50 ppm</td>
</tr>
<tr>
<td>Amyl acetate</td>
<td>Rohm and Haas</td>
<td>STEL</td>
<td>100 ppm</td>
</tr>
<tr>
<td>Amyl acetate</td>
<td>OSHA P1</td>
<td>TWA</td>
<td>525 mg/m3 100 ppm</td>
</tr>
<tr>
<td>Amyl acetate</td>
<td>OSHA P0</td>
<td>TWA</td>
<td>525 mg/m3 100 ppm</td>
</tr>
<tr>
<td>Amyl acetate</td>
<td>NIOSH REL</td>
<td>TWA</td>
<td>525 mg/m3 100 ppm</td>
</tr>
<tr>
<td>Methyl butyl acetate</td>
<td>Rohm and Haas</td>
<td>TWA</td>
<td>50 ppm</td>
</tr>
<tr>
<td>Methyl butyl acetate</td>
<td>Rohm and Haas</td>
<td>STEL</td>
<td>100 ppm</td>
</tr>
<tr>
<td>Methyl butyl acetate</td>
<td>ACGIH</td>
<td>TWA</td>
<td>50 ppm</td>
</tr>
<tr>
<td>Methyl butyl acetate</td>
<td>ACGIH</td>
<td>STEL</td>
<td>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 P0</td>
<td>TWA</td>
<td>22 mg/m3 5 ppm</td>
</tr>
<tr>
<td>Cresol</td>
<td>ACGIH</td>
<td>TWA</td>
<td>5 ppm</td>
</tr>
<tr>
<td>Cresol</td>
<td>ACGIH</td>
<td>TWA</td>
<td>20 mg/m3 Inhalable</td>
</tr>
<tr>
<td>Cresol</td>
<td>ACGIH</td>
<td>TWA</td>
<td></td>
</tr>
<tr>
<td>Cresol</td>
<td>OSHA P0</td>
<td>TWA</td>
<td>22 mg/m3 5 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
Form liquid
Colour red
Odour Sweet odor organic
pH ca.7
Boiling point/boiling range 150 °C (302 °F)
Flash point ca.44 °C (111 °F)
Evaporation rate Slower than ether
Lower explosion limit 1.5 % volLiterature
Upper explosion limit 11.4 % volLiterature

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)

Relative vapor density Heavier than air.
Relative density 1.05
Water solubility insoluble
Auto-ignition temperature 400 °C (752 °F) Literature

VOC’s 650 - 915 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 contact with incompatible materials
Materials to avoid Oxidizing agents Reducing agents Acids Bases
Hazardous decomposition products Carbon monoxide, carbon dioxide, phenols, nitrogen oxides (NOx), oxides of sulfur,
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.

Carcinogenicity:
Not considered carcinogenic by NTP, IARC, and OSHA

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: **Amyl acetate**
- **Acute oral toxicity**  
  LD50 rat  > 1,600 mg/kg

Component: **Methyl butyl acetate**
- **Acute oral toxicity**  
  LD50 rat  12,306 mg/kg

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

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

Component: **Amyl acetate**
- **Acute inhalation toxicity**  
  16,000 mg/m3

Component: **Amyl acetate**
- **Acute inhalation toxicity**  
  no data available

Component: **Methyl butyl acetate**
- **Acute inhalation toxicity**  
  LC50 rat  4 Hour  > 5.2 mg/l

Component: **Cresol**
- **Acute inhalation toxicity**  
  LC50 rat  8 Hour  35.38 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: **Amyl acetate**
- **Acute dermal toxicity**  
  LD50 rabbit  > 17,500 mg/kg

Component: **Amyl acetate**
- **Acute dermal toxicity**  
  no data available

Component: **Methyl butyl acetate***
Acute dermal toxicity

Component: Cresol
  Acute dermal toxicity
  LD50 rabbit 8,359 mg/kg

Component: Anisole
  Skin irritation
  A single application to rabbit skin produced mild irritation.

Component: Amyl acetate
  Skin irritation
  no data available

Component: Methyl butyl acetate
  Skin irritation
  rabbit Moderate irritation.

Component: Cresol
  Skin irritation
  rabbit Corrosive

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

Component: Amyl acetate
  Eye irritation
  slight irritation

Component: Methyl butyl acetate
  Eye irritation
  rabbit Moderate eye irritation

Component: Cresol
  Eye irritation
  rabbit Corrosive

Component: Ethyl lactate
  Sensitisation
  no data available

Component: Amyl acetate
  Sensitisation
  no data available

Component: Methyl butyl acetate
  Sensitisation
  HRIPT (human repeat insult patch test) human Not a sensitizer.

Component: Ethyl lactate
  Carcinogenicity: no data available
Component: Ethyl lactate
  Reproductive toxicity: no data available
Component: Ethyl lactate
  Teratogenicity
  Development effects were not observed in laboratory animals.
Component: Ethyl lactate
  Mutagenicity
  Reverse mutation test using bacteria: Non-mutagenic with and without metabolic activation
Component: Amyl acetate
Subchronic toxicity
Inhalation rat
NOAEL: 1,200 mg/kg
none

Component: Amyl acetate
Carcinogenicity: No data found
Component: Amyl acetate
Reproductive toxicity
No data found
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.
Component: Amyl acetate
Teratogenicity
No data found
Component: Amyl acetate
Mutagenicity
Not mutagenic in Ames Test.
Component: Methyl butyl acetate
Mutagenicity
Tests on bacterial or mammalian cell cultures did not show mutagenic effects.
Component: Cresol
Teratogenicity
Developmental effects were seen in laboratory animals only at dose levels that were maternally toxic.
Component: Cresol
Mutagenicity
Not mutagenic in Ames Test. In vitro tests showed mutagenic effects

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

Toxicity to algae
ErC50 green alga Pseudokirchneriella subcapitata (formerly known as Selenastrum capricornutum) 96 Hour
3,500 mg/l

Toxicity to aquatic invertebrates
EC50 Daphnia magna (Water flea) 48 Hour
560 mg/l

Anisole
### Ecotoxicity effects

<table>
<thead>
<tr>
<th>Toxicity to algae</th>
<th>Growth rate EC50 Pseudokirchneriella subcapitata (green algae) 96 Hour 162 mg/l</th>
</tr>
</thead>
</table>

### Amyl acetate

<table>
<thead>
<tr>
<th>Toxicity to fish</th>
<th>LC50 Mosquito fish (Gambusia affinis) 96 Hour 65 mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxicity to algae</td>
<td>EC50 Algae 24 Hour 550 mg/l</td>
</tr>
</tbody>
</table>

### Methyl butyl acetate

<table>
<thead>
<tr>
<th>Toxicity to fish</th>
<th>LC50 Fathead minnow (Pimephales promelas) 96 Hour Method Not Specified 69 mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxicity to algae</td>
<td>EC50 Pseudokirchneriella subcapitata 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>
</tbody>
</table>

### Cresol

<table>
<thead>
<tr>
<th>Toxicity to fish</th>
<th>LC50 Zebra fish (Danio/Brachydanio rerio) 96 Hour Method Not Specified 9 mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxicity to fish</td>
<td>LC50 Bluegill sunfish (Lepomis macrochirus) 96 Hour Method Not Specified 10 mg/l</td>
</tr>
<tr>
<td>Toxicity to fish</td>
<td>LC50 Pimephales promelas (fathead minnow) 96 Hour Method Not Specified 12.8 mg/l</td>
</tr>
<tr>
<td>Toxicity to bacteria</td>
<td>EC0 Pseudomonas putida 0.5 Hour 250 mg/l</td>
</tr>
</tbody>
</table>
Toxicity to aquatic invertebrates

LC50 Daphnia 48 Hour Method Not Specified
33 - 100 mg/l

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

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

NFPA Hazard Rating

<table>
<thead>
<tr>
<th>Health</th>
<th>Fire</th>
<th>Reactivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2</td>
<td>0</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>
<tr>
<td></td>
<td>Bar denotes a revision from prior MSDS.</td>
</tr>
</tbody>
</table>

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.