1. PRODUCT AND COMPANY IDENTIFICATION

LAMINAR™ DRY FILM PHOTORESIST

Revision Date: 10/10/2011

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>Multifunctional acrylic monomer/oligomer</td>
<td></td>
<td>10.0 - &lt;= 30.0 %</td>
</tr>
<tr>
<td>Multifunctional acrylic monomer</td>
<td></td>
<td>5.0 - &lt;= 10.0 %</td>
</tr>
<tr>
<td>Talc</td>
<td>14807-96-6</td>
<td>5.0 - &lt;= 10.0 %</td>
</tr>
<tr>
<td>Multifunctional acrylic monomer/oligomer</td>
<td></td>
<td>5.0 - &lt;= 10.0 %</td>
</tr>
<tr>
<td>Multifunctional acrylic monomer/oligomer</td>
<td></td>
<td>5.0 - &lt;= 10.0 %</td>
</tr>
<tr>
<td>melamine resin</td>
<td></td>
<td>1.0 - &lt;= 5.0 %</td>
</tr>
<tr>
<td>Acrylic Monomer</td>
<td></td>
<td>1.0 - &lt;= 5.0 %</td>
</tr>
<tr>
<td>Antimony pentoxide</td>
<td>1314-60-9</td>
<td>1.0 - &lt;= 5.0 %</td>
</tr>
</tbody>
</table>

3. HAZARDS IDENTIFICATION

Emergency Overview

Appearance

Form solid
Colour green
Odour
Odorless

**Hazard Summary**

**WARNING!**

- Incidental contact may cause redness or other transient effects
- Contains a material which may cause cancer.
- May cause allergic respiratory reaction and/or skin reaction.

**Potential Health Effects**

**Primary Routes of Entry:** Inhalation, ingestion, eye and skin contact.

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

**Skin:** Material may cause irritation. Prolonged or repeated contact may cause itching and soreness and possible sensitization.

**Ingestion:** Swallowing may have the following effects: irritation of mouth, throat and digestive tract

**Inhalation:** Inhalation may have the following effects: irritation of nose, throat and respiratory tract

**Target Organs:**
- Eye
- Respiratory System
- Skin

---

**4. FIRST AID MEASURES**

**Inhalation:** Move to fresh air. If symptoms persist, call a physician.

**Skin contact:** Wash off immediately with plenty of water.

**Eye contact:** Immediately flush eye(s) with plenty of water.

**Ingestion:** Wash out mouth with water.

**Notes to physician:** Treat symptomatically. Skin or eye contact with uncured photopolymer, vapours or condensate may result in skin or eye irritation, rash or allergic skin rashes.

---

**5. FIREFIGHTING MEASURES**

**Flash point**

not applicable

**Suitable extinguishing media:** Combustible material
Use extinguishing media appropriate for surrounding fire.

**Specific hazards during firefighting:** No specific measures necessary.

**Special protective equipment for firefighters:** Wear full protective clothing and self-contained breathing apparatus.
Further information: This product may give rise to hazardous vapors in a fire.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Wear suitable protective clothing.

Environmental precautions
No specific measures necessary.

Methods for cleaning up
Sweep up and shovel into suitable containers for disposal. Soak up condensate with inert absorbent material and collect in ventilated waste container for disposal.

7. HANDLING AND STORAGE

Handling
Use only in well-ventilated areas. Avoid breathing vapor. Avoid contact with skin, eyes and clothing.

Storage
Storage conditions: Storage area should be: cool dry out of direct sunlight well ventilated away from incompatible materials
Further information on storage conditions: Practice good personal hygiene to prevent accidental exposure.

8. EXPOSURE CONTROLS/PERSOAL 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>Multifunctional acrylic monomer</td>
<td>Rohm and Haas</td>
<td>TWA</td>
<td>2 ppm</td>
</tr>
<tr>
<td>Multifunctional acrylic monomer</td>
<td>Rohm and Haas</td>
<td>STEL</td>
<td>6 ppm</td>
</tr>
<tr>
<td>Multifunctional acrylic monomer</td>
<td>Rohm and Haas</td>
<td>Absorbed via skin</td>
<td></td>
</tr>
<tr>
<td>Multifunctional acrylic monomer</td>
<td>ACGIH</td>
<td>TWA</td>
<td>2 ppm</td>
</tr>
<tr>
<td>Multifunctional acrylic monomer</td>
<td>OSHA P0</td>
<td>TWA</td>
<td>30 mg/m3</td>
</tr>
<tr>
<td>Multifunctional acrylic monomer</td>
<td>NIOSH REL</td>
<td>TWA</td>
<td>6 mg/m3</td>
</tr>
<tr>
<td>Talc</td>
<td>Rohm and Haas</td>
<td>TWA Respirable fraction</td>
<td>0.5 mg/m3</td>
</tr>
<tr>
<td>Talc</td>
<td>Rohm and Haas</td>
<td>STEL</td>
<td>3 mg/m3</td>
</tr>
<tr>
<td>Substance</td>
<td>Source</td>
<td>Unit</td>
<td>Limit</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>-------------------</td>
<td>------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Talc</td>
<td>OSHA P1</td>
<td>TWA</td>
<td>2 mg/m³</td>
</tr>
<tr>
<td>Talc</td>
<td>OSHA Z3</td>
<td>TWA</td>
<td></td>
</tr>
<tr>
<td>Talc</td>
<td>OSHA Z3</td>
<td>TWA Respirable fraction</td>
<td>2 mg/m³</td>
</tr>
<tr>
<td>Talc</td>
<td>OSHA P0</td>
<td>TWA</td>
<td></td>
</tr>
<tr>
<td>Talc</td>
<td>ACGIH</td>
<td>TWA</td>
<td></td>
</tr>
<tr>
<td>Multifunctional acrylic monomer/oligomer</td>
<td>Rohm and Haas</td>
<td>TWA</td>
<td>10 mg/m³</td>
</tr>
<tr>
<td>Multifunctional acrylic monomer/oligomer</td>
<td>Rohm and Haas</td>
<td>TWA</td>
<td>1 mg/m³</td>
</tr>
<tr>
<td>Multifunctional acrylic monomer/oligomer</td>
<td>Rohm and Haas</td>
<td>TWA</td>
<td>5 mg/m³</td>
</tr>
<tr>
<td>Multifunctional acrylic monomer/oligomer</td>
<td>Rohm and Haas</td>
<td>STEL</td>
<td>2 mg/m³</td>
</tr>
<tr>
<td>Multifunctional acrylic monomer/oligomer</td>
<td>ACGIH</td>
<td>TWA Respirable fraction</td>
<td>2 mg/m³</td>
</tr>
<tr>
<td>Multifunctional acrylic monomer/oligomer</td>
<td>ACGIH</td>
<td>STEL Respirable fraction</td>
<td>10 mg/m³</td>
</tr>
<tr>
<td>Multifunctional acrylic monomer/oligomer</td>
<td>OSHA P1</td>
<td>TWA total dust</td>
<td>15 mg/m³</td>
</tr>
<tr>
<td>Multifunctional acrylic monomer/oligomer</td>
<td>OSHA P1</td>
<td>TWA respirable fraction</td>
<td>5 mg/m³</td>
</tr>
<tr>
<td>Multifunctional acrylic monomer/oligomer</td>
<td>OSHA P0</td>
<td>TWA Total</td>
<td>10 mg/m³</td>
</tr>
<tr>
<td>Multifunctional acrylic monomer/oligomer</td>
<td>OSHA P0</td>
<td>TWA</td>
<td>5 mg/m³</td>
</tr>
<tr>
<td>Multifunctional acrylic monomer/oligomer</td>
<td>OSHA P0</td>
<td>STEL</td>
<td>10 mg/m³</td>
</tr>
<tr>
<td>Multifunctional acrylic monomer/oligomer</td>
<td>NIOSH REL</td>
<td>TWA Dust</td>
<td>5 mg/m³</td>
</tr>
<tr>
<td>Multifunctional acrylic monomer/oligomer</td>
<td>NIOSH REL</td>
<td>TWA Fumes</td>
<td>5 mg/m³</td>
</tr>
<tr>
<td>Multifunctional acrylic monomer/oligomer</td>
<td>NIOSH REL</td>
<td>ST Fumes</td>
<td>10 mg/m³</td>
</tr>
<tr>
<td>Multifunctional acrylic monomer/oligomer</td>
<td>NIOSH REL</td>
<td>C Dust</td>
<td>15 mg/m³</td>
</tr>
<tr>
<td>Acrylic Monomer</td>
<td>Rohm and Haas</td>
<td>TWA</td>
<td>0.5 ppm</td>
</tr>
<tr>
<td>Acrylic Monomer</td>
<td>Rohm and Haas</td>
<td>STEL</td>
<td>1.5 ppm</td>
</tr>
<tr>
<td>Acrylic Monomer</td>
<td>Rohm and Haas</td>
<td>Absorbed via skin</td>
<td></td>
</tr>
<tr>
<td>Antimony pentoxide</td>
<td>OSHA P1</td>
<td>TWA</td>
<td>0.5 mg/m³ , antimony</td>
</tr>
<tr>
<td>Antimony pentoxide</td>
<td>ACGIH</td>
<td>TWA</td>
<td>0.5 mg/m³ , antimony</td>
</tr>
<tr>
<td>Antimony pentoxide</td>
<td>OSHA P0</td>
<td>TWA</td>
<td>0.5 mg/m³ , antimony</td>
</tr>
<tr>
<td>Antimony pentoxide</td>
<td>NIOSH REL</td>
<td>TWA</td>
<td>0.5 mg/m³ , antimony</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.

Hygiene measures: Wash thoroughly with soap and water after handling condensate or wipes and after cleaning the exhaust ventilation system.

Individual protection measures

   Eye/face protection: Goggles

   Skin protection

   Hand protection: Protective gloves

   Other protection: Normal work wear.

Respiratory protection: No personal respiratory protective equipment normally required. 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

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td></td>
</tr>
<tr>
<td>Form</td>
<td>solid</td>
</tr>
<tr>
<td>Colour</td>
<td>green</td>
</tr>
<tr>
<td>Odour</td>
<td>Odorless</td>
</tr>
<tr>
<td>pH</td>
<td>not applicable</td>
</tr>
<tr>
<td>Boiling point/boiling range</td>
<td>not applicable</td>
</tr>
<tr>
<td>Flash point</td>
<td>not applicable</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>not applicable</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>not applicable</td>
</tr>
<tr>
<td>Relative vapour density</td>
<td>not applicable</td>
</tr>
<tr>
<td>Relative density</td>
<td>not applicable</td>
</tr>
<tr>
<td>Water solubility</td>
<td>insoluble</td>
</tr>
<tr>
<td>VOC's</td>
<td>0.00 g/L</td>
</tr>
</tbody>
</table>

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

10. STABILITY AND REACTIVITY

Hazardous reactions: Stable under normal conditions.
Conditions to avoid: High temperatures

Materials to avoid: Oxidizers

Hazardous decomposition products: Smoke, soot, and toxic/irritating fumes (i.e., carbon dioxide, carbon monoxide, etc.). Acrylics, monomer vapors, oxides of bromine, hydrogen bromide,

polymerisation: exposure to ultraviolet light will eventually cause non-hazardous polymerization of the dry film

11. TOXICOLOGICAL INFORMATION

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

Skin irritation: The substances accumulated in the condensate, among them acrylate monomers, can lead to delayed skin burns and skin sensitization after skin contact.

Component: Multifunctional acrylic monomer/oligomer
Acute oral toxicity: LD50 rat > 5,000 mg/kg

Component: melamine resin
Acute oral toxicity: LD50 rat 5,000 mg/kg

Component: Acrylic Monomer
Acute oral toxicity: LD50 rat 820 mg/kg

Component: Multifunctional acrylic monomer/oligomer
Acute inhalation toxicity: LC50 rat 4 Hour >5 mg/l

Component: Multifunctional acrylic monomer
Acute dermal toxicity: LD50 rabbit 950 mg/kg

Component: Multifunctional acrylic monomer/oligomer
Acute dermal toxicity: LD50 rabbit > 13,000 mg/kg

Component: Acrylic Monomer
Acute dermal toxicity: LD50 rabbit 306 mg/kg

Component: Talc
Eye irritation: rabbit non-irritating

Component: Multifunctional acrylic monomer/oligomer
Eye irritation: rabbit slight irritation

Component: Multifunctional acrylic monomer/oligomer
Eye irritation: rabbit Moderate eye irritation

Component: Acrylic Monomer
Eye irritation
rabbit Severe eye irritation

Component: Multifunctional acrylic monomer/oligomer
Sensitisation Local lymph node assay mouse Skin sensitiser

Component: Acrylic Monomer
Sensitisation Buehler Test guinea pig May cause sensitization by skin contact.

Component: Acrylic Monomer
Sensitisation human May cause sensitization by skin contact.

Component: Talc
Carcinogenicity: In laboratory animals, evidence of carcinogenic activity was observed. Not considered carcinogenic by NTP, IARC, and OSHA

Component: Multifunctional acrylic monomer/oligomer
Mutagenicity 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.

Multifunctional acrylic monomer
Elimination information (persistence and degradability)
Biodegradability OECD Test Guideline 301D or Equivalent
81 %
Readily biodegradable

Bioaccumulation Fish
Bioconcentration factor (BCF): 3.2

Ecotoxicity effects
Toxicity to fish LC50 Rainbow trout (Salmo gairdneri) 96 Hour OECD Test Guideline 203 or Equivalent
27 mg/l

Toxicity to algae ErC50 Algae (Scenedesmus subspicatus) 72 Hour OECD Test Guideline 201 or Equivalent
0.13 mg/l

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

Talc
Elimination information (persistence and degradability)
Biodegradability

No applicable data.

Bioaccumulation

not applicable

Multifunctional acrylic monomer/oligomer

Elimination information (persistence and degradability)

Biodegradability

not applicable

Ecotoxicity effects

Toxicity to fish

static test LC50 Oncorhynchus mykiss (rainbow trout) 96 Hour Method Not Specified
1.1 mg/l

Toxicity to algae

Ec50 Pseudokirchneriella subcapitata (green algae) 96 Hour
0.14 mg/l

Toxicity to aquatic invertebrates

EC50 Daphnia magna (Water flea) 48 Hour
5 mg/l

Toxicity to aquatic invertebrates

static test LC50 Daphnia magna (Water flea) 48 Hour Method Not Specified
24.6 mg/l

Acrylic Monomer

Elimination information (persistence and degradability)

Biodegradability

OECD Test Guideline 301C or Equivalent
83 %
Readily biodegradable
10-day Window: Pass

Physico-chemical removability

Rapidly hydrolyzed under alkaline conditions.

Ecotoxicity effects

Toxicity to fish

flow-through test LC50 Fathead minnow (Pimephales promelas) 96 Hour OECD Test Guideline 203 or Equivalent
3.1 mg/l

Toxicity to algae

static test EC50 Algae (Selenastrum capricornutum) 72 Hour OECD Test Guideline 201
6.98 mg/l

Toxicity to aquatic invertebrates

static test EC50 Daphnia magna 48 Hour OECD Test Guideline 202
24 mg/l

Chemical Fate

Chemical Oxygen Demand (COD)

1,700 mg/g

13. DISPOSAL CONSIDERATIONS

Environmental precautions: No specific measures necessary.
Disposal
Dispose in accordance with all local, state (provincial), and federal regulations. This product has been evaluated for RCRA characteristics and does not meet the criteria of hazardous waste if discarded in its purchased form. 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 for transport

Classification for SEA transport (IMO-IMDG):
Not regulated (Not dangerous for transport)

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

15. REGULATORY INFORMATION

Workplace Classification
OSHA: Irritant
Sensitiser

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 health hazard
Delayed (chronic) Health Hazard

SARA TITLE III: Section 313 Information (40CFR372)
This product contains a chemical which is listed in Section 313 at or above de minimis concentrations.
SARA Title III Components: Antimony Compounds

United States TSCA Inventory (US.TSCA): The product meets the definition of an article and is exempt from inventory requirements.

California (Proposition 65)
This product contains a component or components known to the state of California to cause cancer and/or reproductive harm.
Components: Ethylene Oxide 75-21-8
16. OTHER INFORMATION

NFPA Hazard Rating

<table>
<thead>
<tr>
<th>Health</th>
<th>Fire</th>
<th>Reactivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1</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.

Version: 1.0
Print Date: 01/10/2012