SAFETY DATA SHEET
ROHM AND HAAS ELECTRONIC MATERIALS LLC

Product name: INTERVIA™ PHOTODIELECTRIC 8023-10

ROHM AND HAAS ELECTRONIC MATERIALS LLC encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. IDENTIFICATION

Product name: INTERVIA™ PHOTODIELECTRIC 8023-10

Recommended use of the chemical and restrictions on use
Identified uses: For industrial use: use in the electronic packaging of semiconductor devices
Uses advised against: We recommend that you use this product in a manner consistent with the listed use. If your intended use is not consistent with the stated use, please contact your sales or technical service representative.

COMPANY IDENTIFICATION
ROHM AND HAAS ELECTRONIC MATERIALS LLC
A Subsidiary of The Dow Chemical Company
455 FOREST STREET
MARLBOROUGH MA  01752
UNITED STATES

Customer Information Number: 215-592-3000
SDSQuestion@dow.com

EMERGENCY TELEPHONE NUMBER
24-Hour Emergency Contact: 1 800 424 9300
Local Emergency Contact: 800-424-9300

2. HAZARDS IDENTIFICATION

Hazard classification
GHS classification in accordance with 29 CFR 1910.1200
Flammable liquids - Category 3
Skin irritation - Category 2
Eye irritation - Category 2A
Skin sensitisation - Category 1
Carcinogenicity - Category 2
Specific target organ toxicity - single exposure - Category 3
Short-term (acute) aquatic hazard - Category 2
Long-term (chronic) aquatic hazard - Category 2

Label elements
Hazard pictograms
Signal word: **WARNING!**

**Hazards**
Flammable liquid and vapour.
Causes skin irritation.
May cause an allergic skin reaction.
Causes serious eye irritation.
May cause drowsiness or dizziness.
Suspected of causing cancer.
Toxic to aquatic life with long lasting effects.

**Precautionary statements**

**Prevention**
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Keep away from heat/sparks/open flames/hot surfaces. No smoking.
Keep container tightly closed.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ventilating/lighting equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Avoid breathing dust/fume/gas/mist/vapours/spray.
Wash skin thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Contaminated work clothing should not be allowed out of the workplace.
Avoid release to the environment.
Wear protective gloves/protective clothing/eye protection/face protection.

**Response**
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF exposed or concerned: Get medical advice/attention.
If skin irritation or rash occurs: Get medical advice/attention.
If eye irritation persists: Get medical advice/attention.
Take off contaminated clothing and wash before reuse.
In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
In case of fire: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide to extinguish.
Collect spillage.

**Storage**
Store in a well-ventilated place. Keep container tightly closed.
Store in a well-ventilated place. Keep cool.
Store locked up.

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

**Other hazards**
No data available

**Further information**
The values listed below represent the percentages of ingredients of unknown toxicity.
The following percentage of the mixture consists of ingredient(s) with unknown acute oral toxicity: 2.6144 %
The following percentage of the mixture consists of ingredient(s) with unknown acute dermal toxicity: 2.6144 %
The following percentage of the mixture consists of ingredient(s) with unknown acute inhalation toxicity: 2.6144 %
The following percentage of the mixture consists of ingredient(s) with unknown hazards to the aquatic environment: 2.6144 %

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

**Chemical nature:** Solution of organic compounds
This product is a mixture.

<table>
<thead>
<tr>
<th>Component</th>
<th>CASRN</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propylene glycol methyl ether acetate</td>
<td>108-65-6</td>
<td>30.0 - 40.0 %</td>
</tr>
<tr>
<td>Bisphenol-A, Epichlorohydrin Polymer</td>
<td>25068-38-6</td>
<td>15.0 - 25.0 %</td>
</tr>
<tr>
<td>Phenolic Resin</td>
<td></td>
<td>10.0 - 20.0 %</td>
</tr>
<tr>
<td>Modified epoxy resin</td>
<td></td>
<td>1.0 - 10.0 %</td>
</tr>
<tr>
<td>Novolak Resin</td>
<td></td>
<td>1.0 - 10.0 %</td>
</tr>
<tr>
<td>2,2'-(Octahydro-4,7-methano-1H-indenediyldi)bis(methyleneoxymethylene)dioxirane</td>
<td>50985-55-2</td>
<td>1.0 - 5.0 %</td>
</tr>
<tr>
<td>Photo acid generator</td>
<td></td>
<td>1.0 - 5.0 %</td>
</tr>
<tr>
<td>Propylene carbonate</td>
<td>108-32-7</td>
<td>1.0 - 5.0 %</td>
</tr>
<tr>
<td>melamine resin</td>
<td></td>
<td>1.0 - 5.0 %</td>
</tr>
<tr>
<td>Glycidoxypropyltrimethoxysilane</td>
<td>2530-83-8</td>
<td>1.0 - 5.0 %</td>
</tr>
<tr>
<td>Organic Siloxane Surfactant</td>
<td></td>
<td>0.1 - 1.0 %</td>
</tr>
</tbody>
</table>
4. FIRST AID MEASURES

Description of first aid measures

General advice:
If potential for exposure exists refer to Section 8 for specific personal protective equipment. First Aid responders should pay attention to self-protection and use the recommended protective clothing

Inhalation: Remove from exposure. If there is difficulty in breathing, give oxygen. Immediate medical attention is required.

Skin contact: Wash off with soap and 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. Do NOT induce vomiting. Obtain medical attention.

Most important symptoms and effects, both acute and delayed:
Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

Indication of any immediate medical attention and special treatment needed

Notes to physician: Treat symptomatically. Aspiration during swallowing or vomiting may result in lung injury.

5. FIREFIGHTING MEASURES

Suitable extinguishing media: Dry sand  Dry chemical  Alcohol-resistant foam  Carbon dioxide (CO2)  Keep containers and surroundings cool with water spray.

Unsuitable extinguishing media: Straight or direct water streams may not be effective to extinguish fire.

Special hazards arising from the substance or mixture

Hazardous combustion products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Carbon monoxide. Carbon dioxide. Combustion products may include trace amounts of: Nitrogen oxides. Sulfur oxides.

Unusual Fire and Explosion Hazards: 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.

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry.
Special protective equipment for firefighters: Wear full protective clothing and self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: 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 and materials for containment and 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

Precautions for safe handling: Use local exhaust ventilation. Avoid contact with eyes, skin and clothing. Keep container tightly closed.

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

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters
If exposure limits exist, they are listed below. If no exposure limits are displayed, then no values are applicable.

<table>
<thead>
<tr>
<th>Component</th>
<th>Regulation</th>
<th>Type of listing</th>
<th>Value/Notation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propylene glycol methyl ether acetate</td>
<td>Dow IHG</td>
<td>TWA</td>
<td>30 ppm</td>
</tr>
<tr>
<td>Bisphenol-A, Epichlorohydrin Polymer</td>
<td>Dow IHG</td>
<td>TWA</td>
<td>10 mg/m3</td>
</tr>
<tr>
<td>Glycidoxypropyltrimethoxysilane</td>
<td>Dow IHG</td>
<td>TWA</td>
<td>0.5 ppm</td>
</tr>
</tbody>
</table>

Exposure controls
Engineering controls: 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

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance</strong></td>
<td></td>
</tr>
<tr>
<td>Physical state</td>
<td>liquid</td>
</tr>
<tr>
<td>Color</td>
<td>light orange</td>
</tr>
<tr>
<td>Odor</td>
<td>sweet</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>pH</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td>Melting point/range</td>
<td>No data available</td>
</tr>
<tr>
<td>Freezing point</td>
<td>No data available</td>
</tr>
<tr>
<td>Boiling point (760 mmHg)</td>
<td>150 °C (302 °F)</td>
</tr>
<tr>
<td>Flash point</td>
<td>49 °C (120 °F)</td>
</tr>
<tr>
<td><strong>Evaporation Rate (Butyl Acetate = 1)</strong></td>
<td>Slower than ether</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Lower explosion limit</td>
<td>No data available</td>
</tr>
<tr>
<td>Upper explosion limit</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative Vapor Density (air = 1)</td>
<td>Heavier than air.</td>
</tr>
<tr>
<td>Relative Density (water = 1)</td>
<td>1.05</td>
</tr>
<tr>
<td>Water solubility</td>
<td>insoluble</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>This product is a mixture. See Section 12 for individual component data.</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Kinematic Viscosity</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>Not explosive</td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>No</td>
</tr>
<tr>
<td>Molecular weight</td>
<td>No data available for mixture</td>
</tr>
<tr>
<td><strong>Volatile Organic Compounds</strong></td>
<td>399.00 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

Reactivity: No data available

Chemical stability: Stable under normal conditions.

Possibility of hazardous reactions: No dangerous reaction known under conditions of normal use. Product will not undergo hazardous polymerization.

Conditions to avoid: Heat, flames and sparks. Exposure to water vapour. Excessive heat contact with incompatible materials

Incompatible materials: Oxidizing agents  Strong acids  Strong Mineral Acids

Hazardous decomposition products: Combustion will generate: oxides of carbon  oxides of sulfur oxides of silicon  Nitrogen oxides (NOx) hydrogen fluoride  formaldehyde-like Acids  Aldehydes  Amines  Hydrogen  Methanol  phenolic compounds  acid smoke and irritating fumes

11. TOXICOLOGICAL INFORMATION

Toxicological information appears in this section when such data is available.

Acute toxicity

Acute oral toxicity
Product test data not available. Refer to component data.

Acute dermal toxicity
Product test data not available. Refer to component data.

Acute inhalation toxicity
Product test data not available. Refer to component data.

Skin corrosion/irritation
Product test data not available. Refer to component data.

Serious eye damage/eye irritation
Product test data not available. Refer to component data.

Sensitization
Product test data not available. Refer to component data.

Specific Target Organ Systemic Toxicity (Single Exposure)
Product test data not available. Refer to component data.

Specific Target Organ Systemic Toxicity (Repeated Exposure)
Product test data not available. Refer to component data.

Carcinogenicity
Product test data not available. Refer to component data.
Teratogenicity
Product test data not available. Refer to component data.

Reproductive toxicity
Product test data not available. Refer to component data.

Mutagenicity
Product test data not available. Refer to component data.

Aspiration Hazard
Product test data not available. Refer to component data.

COMPONENTS INFLUENCING TOXICOLOGY:

Propylene glycol methyl ether acetate

Acute oral toxicity
Observations in animals include: Lethargy. LD50, Rat, > 5,000 mg/kg

Acute dermal toxicity
LD50, Rabbit, > 5,000 mg/kg

Acute inhalation toxicity
LC0, Rat, 6 Hour, vapour, > 23.5 mg/l No deaths occurred at this concentration.

Skin corrosion/irritation
Prolonged contact is essentially nonirritating to skin.
Repeated contact may cause skin irritation with local redness.
Based on available data, the classification criteria are not met.

Serious eye damage/eye irritation
May cause pain disproportionate to the level of irritation to eye tissues.
May cause slight eye irritation.
May cause slight corneal injury.
Based on available data, the classification criteria are not met.

Sensitization
For skin sensitization:
Did not cause allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:
No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)
May cause drowsiness or dizziness.
Route of Exposure: Oral
Target Organs: Central nervous system

Specific Target Organ Systemic Toxicity (Repeated Exposure)
Not classified due to data which are conclusive although insufficient for classification.
In animals, effects have been reported on the following organs:
Kidney.
Liver.
Nasal tissue.
Carcinogenicity
Similar material(s) did not cause cancer in laboratory animals.

Teratogenicity
Did not cause birth defects or other effects in the fetus even at doses which caused toxic effects in the mother.

Reproductive toxicity
In animal studies, did not interfere with reproduction. In animal studies, did not interfere with fertility.

Mutagenicity
In vitro genetic toxicity studies were negative.

Aspiration Hazard
Based on physical properties, not likely to be an aspiration hazard.

Bisphenol-A, Epichlorohydrin Polymer

Acute oral toxicity
LD50, Rat, > 15,000 mg/kg

Acute dermal toxicity
LD50, Rabbit, 23,000 mg/kg

Acute inhalation toxicity
At room temperature, exposure to vapor is minimal due to low volatility. Vapor from heated material may cause respiratory irritation. The LC50 has not been determined.

Skin corrosion/irritation
Irritating to skin.

Serious eye damage/eye irritation
Irritating to eyes.

Sensitization
Has caused allergic skin reactions in humans.

For respiratory sensitization:
No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)
The substance or mixture is not classified as specific target organ toxicant, single exposure.

Specific Target Organ Systemic Toxicity (Repeated Exposure)
No relevant data found.

Carcinogenicity
No relevant data found.

Teratogenicity
Did not cause birth defects or any other fetal effects in laboratory animals.

Reproductive toxicity
In animal studies, did not interfere with reproduction.

**Mutagenicity**
In vitro studies showed both positive and negative effects. In vivo tests did not show mutagenic effects

**Aspiration Hazard**
Based on physical properties, not likely to be an aspiration hazard.

**Phenolic Resin**

Acute oral toxicity
No relevant data found.

Acute dermal toxicity
No relevant data found.

Acute inhalation toxicity
No relevant data found.

Skin corrosion/irritation
No relevant data found.

Serious eye damage/eye irritation
No relevant data found.

Sensitization
For skin sensitization:
No relevant data found.

For respiratory sensitization:
No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)
Available data are inadequate to determine single exposure specific target organ toxicity.

Specific Target Organ Systemic Toxicity (Repeated Exposure)
No relevant data found.

Carcinogenicity
No relevant data found.

Teratogenicity
No relevant data found.

Reproductive toxicity
No relevant data found.

Mutagenicity
No relevant data found.

Aspiration Hazard
Based on physical properties, not likely to be an aspiration hazard.

**Modified epoxy resin**
Acute inhalation toxicity
The LC50 has not been determined.

Skin corrosion/irritation
Brief contact may cause slight skin irritation with local redness.

Serious eye damage/eye irritation
May cause slight temporary eye irritation.
Corneal injury is unlikely.

Sensitization
For skin sensitization:
No relevant data found.

For respiratory sensitization:
No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)
The substance or mixture is not classified as specific target organ toxicant, single exposure.

Specific Target Organ Systemic Toxicity (Repeated Exposure)
No relevant data found.

Carcinogenicity
No relevant data found.

Teratogenicity
No relevant data found.

Reproductive toxicity
No relevant data found.

Mutagenicity
No relevant data found.

Aspiration Hazard
No aspiration toxicity classification

Novolak Resin
Acute oral toxicity
Single dose oral LD50 has not been determined.

Acute dermal toxicity
The dermal LD50 has not been determined.

Acute inhalation toxicity
The LC50 has not been determined.

Skin corrosion/irritation
Brief contact may cause slight skin irritation with local redness.

Serious eye damage/eye irritation
May cause slight temporary eye irritation.
Corneal injury is unlikely.
Sensitization
For skin sensitization:
No relevant data found.

For respiratory sensitization:
No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)
The substance or mixture is not classified as specific target organ toxicant, single exposure.

Specific Target Organ Systemic Toxicity (Repeated Exposure)
No relevant data found.

Carcinogenicity
No relevant data found.

Teratogenicity
No relevant data found.

Reproductive toxicity
No relevant data found.

Mutagenicity
No relevant data found.

Aspiration Hazard
No aspiration toxicity classification

2,2''-[(Octahydro-4,7-methano-1H-indenediyl)bis(methyleneoxymethylene)]dioxirane

Acute inhalation toxicity
No adverse effects are anticipated from single exposure to dust.

Skin corrosion/irritation
No relevant data found.

Serious eye damage/eye irritation
No relevant data found.

Sensitization
No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)
The substance or mixture is not classified as specific target organ toxicant, single exposure.

Specific Target Organ Systemic Toxicity (Repeated Exposure)
No relevant data found.

Carcinogenicity
No relevant data found.

Teratogenicity
No relevant data found.

**Reproductive toxicity**
No relevant information found.

**Mutagenicity**
No relevant data found.

**Aspiration Hazard**
No aspiration toxicity classification

**Photo acid generator**

**Acute oral toxicity**
Single dose oral LD50 has not been determined.

**Acute dermal toxicity**
The dermal LD50 has not been determined.

**Acute inhalation toxicity**
The LC50 has not been determined.

**Skin corrosion/irritation**
Brief contact may cause moderate skin irritation with local redness.

**Serious eye damage/eye irritation**
May cause moderate eye irritation.
May cause moderate corneal injury.

**Sensitization**
For skin sensitization:
Skin contact may cause an allergic skin reaction.

For respiratory sensitization:
No relevant data found.

**Specific Target Organ Systemic Toxicity (Single Exposure)**
May cause respiratory irritation.
Route of Exposure: Inhalation
Target Organs: Respiratory Tract

**Specific Target Organ Systemic Toxicity (Repeated Exposure)**
No relevant data found.

**Carcinogenicity**
No relevant data found.

**Teratogenicity**
No relevant data found.

**Reproductive toxicity**
No relevant data found.

**Mutagenicity**
No relevant data found.
Aspiration Hazard
No aspiration toxicity classification

Propylene carbonate

Acute oral toxicity
LD50, Rat, > 5,000 mg/kg

Acute dermal toxicity
LD50, Rabbit, > 3,000 mg/kg

Acute inhalation toxicity
No adverse effects are anticipated from single exposure to vapor.

The LC50 has not been determined.

Skin corrosion/irritation
Prolonged exposure not likely to cause significant skin irritation.
May cause more severe response if skin is abraded (scratched or cut).

Serious eye damage/eye irritation
May cause moderate eye irritation.
May cause moderate corneal injury.

Sensitization
Did not cause allergic skin reactions when tested in humans.

For respiratory sensitization:
No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)
Available data are inadequate to determine single exposure specific target organ toxicity.

Specific Target Organ Systemic Toxicity (Repeated Exposure)
Repeated skin application to laboratory animals did not produce systemic toxicity.

Carcinogenicity
Did not cause cancer in laboratory animals.

Teratogenicity
Did not cause birth defects or any other fetal effects in laboratory animals.

Reproductive toxicity
No relevant data found.

Mutagenicity
In vitro genetic toxicity studies were negative.

Animal genetic toxicity studies were negative.

Aspiration Hazard
Based on available information, aspiration hazard could not be determined.

melamine resin
Acute oral toxicity
Single dose oral LD50 has not been determined.

Acute dermal toxicity
LD50, Rabbit, > 5,000 mg/kg

Acute inhalation toxicity
The LC50 has not been determined.

Skin corrosion/irritation
Brief contact may cause slight skin irritation with local redness.

Serious eye damage/eye irritation
May cause slight temporary eye irritation.
Corneal injury is unlikely.

Sensitization
For skin sensitization:
No relevant data found.

For respiratory sensitization:
No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)
The substance or mixture is not classified as specific target organ toxicant, single exposure.

Specific Target Organ Systemic Toxicity (Repeated Exposure)
No relevant data found.

Carcinogenicity
No relevant data found.

Teratogenicity
No relevant data found.

Reproductive toxicity
No relevant data found.

Mutagenicity
No relevant data found.

Aspiration Hazard
No aspiration toxicity classification

Glycidoxypropyltrimethoxysilane

Acute oral toxicity
LD50, Rat, 8,025 mg/kg

Acute dermal toxicity
LD50, Rat, 4,250 mg/kg

Acute inhalation toxicity
No adverse effects are anticipated from single exposure to mist. Vapor may cause irritation of the upper respiratory tract (nose and throat).
LC50, Rat, 4 Hour, dust/mist, > 5.3 mg/l

**Skin corrosion/irritation**  
Prolonged contact may cause moderate skin irritation with local redness.

**Serious eye damage/eye irritation**  
May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur.

**Sensitization**  
Did not cause allergic skin reactions when tested in guinea pigs.  
Did not cause allergic skin reactions when tested in humans.

For respiratory sensitization:  
No relevant data found.

**Specific Target Organ Systemic Toxicity (Single Exposure)**  
Evaluation of available data suggests that this material is not an STOT-SE toxicant.

**Specific Target Organ Systemic Toxicity (Repeated Exposure)**  
Based on available data, repeated exposures are not anticipated to cause significant adverse effects.

**Carcinogenicity**  
Did not cause cancer in laboratory animals.

**Teratogenicity**  
Did not cause birth defects in laboratory animals.

**Reproductive toxicity**  
In animal studies, did not interfere with reproduction.

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

**Aspiration Hazard**  
Based on available information, aspiration hazard could not be determined.

**Organic Siloxane Surfactant**

**Acute oral toxicity**  
LD50, Rat, > 5,000 mg/kg

**Acute dermal toxicity**  
LD50, Rat, > 2,000 mg/kg

**Acute inhalation toxicity**  
The LC50 has not been determined.

**Skin corrosion/irritation**  
Brief contact may cause slight skin irritation with local redness.

**Serious eye damage/eye irritation**
Essentially nonirritating to eyes.

**Sensitization**
Did not cause allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:
No relevant data found.

**Specific Target Organ Systemic Toxicity (Single Exposure)**
Available data are inadequate to determine single exposure specific target organ toxicity.

**Specific Target Organ Systemic Toxicity (Repeated Exposure)**
No relevant data found.

**Carcinogenicity**
No relevant data found.

**Teratogenicity**
No relevant data found.

**Reproductive toxicity**
No relevant data found.

**Mutagenicity**
No relevant data found.

**Aspiration Hazard**
Based on available information, aspiration hazard could not be determined.

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### 12. ECOLOGICAL INFORMATION

Ecotoxicological information appears in this section when such data is available.

**Toxicity**

**Propylene glycol methyl ether acetate**

**Acute 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).

LC50, *Oncorhynchus mykiss* (rainbow trout), 96 Hour, 134 mg/l, Method Not Specified.

**Acute toxicity to aquatic invertebrates**
EC50, *Daphnia magna* (Water flea), 48 Hour, 408 mg/l, Method Not Specified.

**Acute toxicity to algae/aquatic plants**
EcC50, *Pseudokirchneriella subcapitata* (microalgae), static test, 96 Hour, > 1,000 mg/l, OECD Test Guideline 201 or Equivalent

**Bisphenol-A, Epichlorohydrin Polymer**

**Acute toxicity to fish**
Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).
LC50, Pimephales promelas (fathead minnow), static test, 96 Hour, 3.1 mg/l
LC50, Oncorhynchus mykiss (rainbow trout), semi-static test, 96 Hour, 2 mg/l

**Acute toxicity to aquatic invertebrates**
EC50, Daphnia magna (Water flea), static test, 48 Hour, 1.8 mg/l

**Acute toxicity to algae/aquatic plants**
ErC50, Scenedesmus capricornutum (fresh water algae), static test, 72 Hour, 11 mg/l

**Toxicity to bacteria**
No data available

**Chronic toxicity to aquatic invertebrates**
NOEC, Daphnia magna (Water flea), 21 d, 0.3 mg/l

**Phenolic Resin**
**Acute toxicity to fish**
No relevant data found.

**Modified epoxy resin**
**Acute toxicity to fish**
No relevant data found.

**Novolak Resin**
**Acute toxicity to fish**
No relevant data found.

**2,2’-[(Octahydro-4,7-methano-1H-indenediyl)bis(methyleneoxymethylene)]dioxirane**
**Acute toxicity to fish**
No relevant data found.

**Photo acid generator**
**Acute toxicity to fish**
Material is highly toxic to aquatic organisms on an acute basis (LC50/EC50 between 0.1 and 1 mg/L in the most sensitive species tested).
LC50, Danio rerio (zebra fish), 96 Hour, 4.9 mg/l, Method Not Specified.

**Acute toxicity to aquatic invertebrates**
EC50, Daphnia magna, 48 Hour, 0.2 mg/l, Method Not Specified.

**Propylene carbonate**
**Acute 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).
LC50, Cyprinus carpio (Carp), semi-static test, 96 Hour, > 1,000 mg/l

**Acute toxicity to aquatic invertebrates**
EC50, Daphnia magna (Water flea), 48 Hour, > 1,000 mg/l, OECD Test Guideline 202 or Equivalent

**Acute toxicity to algae/aquatic plants**
EC50, alga Scenedesmus sp., 72 Hour, Biomass, > 900 mg/l, Method Not Specified.
Toxicity to bacteria
EC50, activated sludge, 30 min, > 800 mg/l, OECD 209 Test

Melamine resin
Acute toxicity to fish
No relevant data found.

Glycidoxypropyltrimethoxysilane
Acute 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).
LC50, Oncorhynchus mykiss (rainbow trout), Static, 96 Hour, 237 mg/l
LC50, Lepomis macrochirus (Bluegill sunfish), Static, 96 Hour, 237 mg/l

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna (Water flea), static test, 48 Hour, 710 mg/l

Acute toxicity to algae/aquatic plants
Ec50, alga Scenedesmus sp., 72 Hour, Biomass, 255 mg/l
EC50, blue-green alga Anabaena flos-aquae, static test, 7 d, 119 mg/l

Toxicity to bacteria
NOEC, activated sludge, Static, 3 Hour, Respiration rates., > 100 mg/l, OECD 209 Test

Chronic toxicity to aquatic invertebrates
LOEC, Daphnia magna (Water flea), semi-static test, 21 d, > 100 mg/l

Organic Siloxane Surfactant
Acute 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).
LC50, Cyprinodon variegatus (sheepshead minnow), 96 Hour, > 1,080 mg/l, OPPTS 850.1075
LC50, Oncorhynchus mykiss (rainbow trout), 96 Hour, 892 mg/l, EPA-660-75-009

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna, 48 Hour, > 1,040 mg/l, EPA-660/3-75-009

Persistence and degradability

Propylene glycol methyl ether acetate
Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Material is ultimately biodegradable (reaches > 70% mineralization in OECD test(s) for inherent biodegradability).
10-day Window: Pass
Biodegradation: 83 %
Exposure time: 28 d
Method: OECD Test Guideline 301F or Equivalent
10-day Window: Not applicable
Biodegradation: 100 %
Exposure time: 28 d
Method: OECD Test Guideline 302B or Equivalent

Theoretical Oxygen Demand: 1.82 mg/mg
**Bisphenol-A, Epichlorohydrin Polymer**

**Biodegradability:**
10-day Window: Not applicable  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.

**Biodegradation:** 12 %
**Exposure time:** 28 d
**Method:** OECD Test Guideline 302B or Equivalent

**Phenolic Resin**

**Biodegradability:** No relevant data found.

**Modified epoxy resin**

**Biodegradability:** No relevant data found.

**Novolak Resin**

**Biodegradability:** No relevant data found.

**2,2'-(Octahydro-4,7-methano-1H-indenediyl)bis(methyleneoxymethylene)]dioxirane**

**Biodegradability:** No relevant data found.

**Photo acid generator**

**Biodegradability:** No relevant data found.

**Propylene carbonate**

**Biodegradability:** Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Material is ultimately biodegradable (reaches > 70% mineralization in OECD test(s) for inherent biodegradability).

10-day Window: Pass

**Biodegradation:** 94 %
**Exposure time:** 28 d
**Method:** OECD Test Guideline 301E or Equivalent

10-day Window: Not applicable

**Biodegradation:** > 97 %
**Exposure time:** 28 d
**Method:** OECD Test Guideline 302B or Equivalent

**Theoretical Oxygen Demand:** 1.25 mg/mg

**Photodegradation**

**Test Type:** Half-life (indirect photolysis)

**Sensitization:** OH radicals

**Atmospheric half-life:** 34 Hour

**Method:** Estimated.

**melamine resin**

**Biodegradability:** No relevant data found.

**Glycidoxypropyltrimethoxysilane**

**Biodegradability:** Chemical degradation (hydrolysis) is expected in the environment. Material is expected to biodegrade very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.

10-day Window: Fail
Biodegradation: 37 %
Exposure time: 28 d

Organic Siloxane Surfactant
Biodegradability: No relevant data found.

Bioaccumulative potential

Propylene glycol methyl ether acetate
Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient: n-octanol/water(log Pow): 1.2 Measured

Bisphenol-A, Epichlorohydrin Polymer
Bioaccumulation: Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).
Partition coefficient: n-octanol/water(log Pow): 3.242 at 25 °C estimated

Phenolic Resin
Bioaccumulation: No relevant data found.

Modified epoxy resin
Bioaccumulation: No relevant data found.

Novolak Resin
Bioaccumulation: No relevant data found.

2,2'-(Octahydro-4,7-methano-1H-indenediyl)bis(methyleneoxymethylene)dioxirane
Bioaccumulation: No relevant data found.

Photo acid generator
Bioaccumulation: No relevant data found.

Propylene carbonate
Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3). Potential for mobility in soil is very high (Koc between 0 and 50). Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process. Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient: n-octanol/water(log Pow): -0.41 Measured

Melamine resin
Bioaccumulation: No relevant data found.

Glycidoxypropyltrimethoxysilane
Partition coefficient: n-octanol/water(log Pow): -2.6

Organic Siloxane Surfactant
Bioaccumulation: No relevant data found.

Mobility in soil

Propylene glycol methyl ether acetate
Potential for mobility in soil is very high (Koc between 0 and 50).
Partition coefficient (Koc): 1.7 Estimated.
Bisphenol-A, Epichlorohydrin Polymer
Potential for mobility in soil is low (Koc between 500 and 2000).
Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.
Partition coefficient (Koc): 1800 - 4400 Estimated.

Phenolic Resin
No relevant data found.

Modified epoxy resin
No relevant data found.

Novolak Resin
No relevant data found.

2,2'-(Octahydro-4,7-methano-1H-indenediy)bis(methyleneoxymethylene)dioxirane
No relevant data found.

Photo acid generator
No data available

Propylene carbonate
Potential for mobility in soil is very high (Koc between 0 and 50).
Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.
Partition coefficient (Koc): 15 Estimated.

melamine resin
No relevant data found.

Glycidoxypropyltrimethoxysilane
No relevant data found.

Organic Siloxane Surfactant
No relevant data found.

13. DISPOSAL CONSIDERATIONS

Disposal methods: 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.

Treatment and disposal methods of used packaging: Empty containers retain product residues. Follow label warnings even after container is emptied. Improper disposal or reuse of this container may be dangerous and illegal. Refer to applicable federal, state and local regulations.

Contaminated packaging: Dispose of as unused product. CONTAINERS MAY BE HAZARDOUS WHEN EMPTY. Since emptied containers retain product residue follow all (M)SDS and label warnings even after container is emptied.
14. TRANSPORT INFORMATION

DOT

<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>

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>
<tr>
<td>Marine pollutant</td>
<td>Epoxy resin, Photo acid generator</td>
</tr>
<tr>
<td>Transport in bulk</td>
<td>Consult IMO regulations before transporting ocean bulk of MARPOL 73/78 and the IBC or IGC Code</td>
</tr>
</tbody>
</table>

Classification for AIR transport (IATA/ICAO):

<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>

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

- Flammable (gases, aerosols, liquids, or solids)
- Skin corrosion or irritation
- Serious eye damage or eye irritation
- Respiratory or skin sensitisation
- Carcinogenicity
- Specific target organ toxicity (single or repeated exposure)

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313

This product does not contain a chemical which is listed in Section 313 at or above de minimis concentrations.
Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA)
Section 103
This material does not contain any components with a CERCLA RQ.

Significant New Use Rule
This product contains chemical substances subject to a Significant New Use Rule, 40 CFR 721.2950. Release to water is limited to a 1 part-per-billion (ppb) maximum concentration. Compliance point is the receiving water body (river) or wastewater treatment facility (whichever comes first).

Components
Novolak Resin

Pennsylvania Right To Know
The following chemicals are listed because of the additional requirements of Pennsylvania law:

<table>
<thead>
<tr>
<th>Components</th>
<th>CASRN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propylene glycol methyl ether acetate</td>
<td>108-65-6</td>
</tr>
<tr>
<td>Bisphenol-A, Epichlorohydrin Polymer</td>
<td>25068-38-6</td>
</tr>
<tr>
<td>Phenol, 4-ethenyl-, homopolymer</td>
<td>24979-70-2</td>
</tr>
<tr>
<td>Triethylene glycol modified BPA epoxy resin</td>
<td>647028-24-8</td>
</tr>
<tr>
<td>Polymer of 4,4'-Bis(methoxymethyl) Biphenyl and Phenol</td>
<td>205830-20-2</td>
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<tr>
<td>2,2'-(Octahydro-4,7-methano-1H-indenediyl)bis(methyleneglycol))dioxirane</td>
<td>50985-55-2</td>
</tr>
<tr>
<td>Propylene carbonate</td>
<td>108-32-7</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>50-00-0</td>
</tr>
</tbody>
</table>

California Prop. 65
WARNING: This product can expose you to chemicals including Formaldehyde, Phenyl glycidyl ether, Benzene, which is/are known to the State of California to cause cancer, and Methanol, Benzene, which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

United States TSCA Inventory (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.

16. OTHER INFORMATION

Hazard Rating System
NFPA

<table>
<thead>
<tr>
<th>Health</th>
<th>Flammability</th>
<th>Instability</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2</td>
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Revision
Identification Number: 11124487 / 1304 / Issue Date: 08/27/2018 / Version: 11.0
Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.
Legend

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>Dow IHG</td>
<td>Dow Industrial Hygiene Guideline</td>
</tr>
<tr>
<td>SKIN</td>
<td>Absorbed via skin</td>
</tr>
<tr>
<td>STEL</td>
<td>Short term exposure limit</td>
</tr>
<tr>
<td>TWA</td>
<td>8-hr TWA</td>
</tr>
<tr>
<td>US WEEL</td>
<td>USA. Workplace Environmental Exposure Levels (WEEL)</td>
</tr>
</tbody>
</table>

Full text of other abbreviations

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50% of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Information Source and References

This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

ROHM AND HAAS ELECTRONIC MATERIALS LLC urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are
not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.

US