## Section 1. Chemical Product and Company Identification

**Product Name:** Epoch TSV-C1015 Series (TSV-C1015-00 thru 99) Aqueous Dispersion  
**Recommended Use of the Chemical and Restrictions on Use:** Used as polishing slurry in the semiconductor industry and other applications.

**Information on the Manufacturer/Supplier:**

- **Cabot Microelectronics Corporation (CMC) - United States**  
  870 N. Commons Dr. Aurora, IL 60504, United States  
  Telephone No.: (MSDS Requests) 630.585.9471, (Technical Information) 630.375.5576, Facsimile No.: 630.585.9976  
  Emergency Telephone No.: Chemtrec (U.S.) 800.424.9300, Chemtrec (Intl) 703.527.3887, CMC (U.S.) 630.585.9471

- **Cabot Microelectronics Corporation - Japan**  
  1287-19 Oaza-Kitakoyama, Geino-cho-Tsu-Mie, 514-2213 Japan  
  Telephone No.: 81.59.266.0120, Facsimile No.: 81.59.266.0121  
  Emergency Telephone No.: Chemtrec (Intl) 703.527.3887

- **Cabot Microelectronics Corporation - Singapore**  
  Blk 205, #01-53/54, Woodlands Avenue 9, Singapore 738957  
  Telephone No.: 65.6511.0550, Facsimile No.: 65.6511.0540  
  Emergency Telephone No.: Chemtrec (Intl) 703.527.3887

- **Cabot Microelectronics Corporation - Taiwan**  
  3F-1, No. 22, Chu Pei, Hsin Chu Hsien Taiw an 302, R.O.C  
  Telephone No.: 886.3.5526666, Facsimile No.: 886.3.5526677  
  Emergency Telephone No.: Chemtrec (Intl) 703.527.3887

- **Cabot Microelectronics Corporation - Korea**  
  1096, Yanggyo-ri, Oseoong-myeon, Pyeongtaek-si, Gyounggi-do, 451-872 Korea  
  Information Service or Emergency Telephone No.: 031.8053.2210, (Facsimile No.) 031.684.2307

- **CMC - Taiwan**  
  No. 2, Luke 8th Road, Kaohsiung Science Park  
  Lu-Chuh District, Kaohsiung City, 82151, Taipei, R.O.C.  
  Telephone No: 886.7.6955100, Facsimile No: 886.7.6955075  
  Emergency Telephone No.: Chemtrec (Intl) 703.527.3887

- **CMC - Wales**  
  The Business Centre, Cardiff House, Cardiff Road  
  Barry, Vale of Glamorgan, Wales  
  CF63 2BG, United Kingdom  
  Telephone No: 011.441.446.70407

## Section 2. Hazards Identification
Classification: Skin Corrosion/Irritation Category 2; Eye Damage/Irritation Category 2B

Signal Word: Warning
Hazard Statement: -Causes skin irritation.
- Causes serious eye irritation.

Precautionary Statements: - Wear protective gloves/clothing and eye/face protection.
- Wash hands thoroughly after handling.
- If on skin: Wash with plenty of soap and water.
- Take off contaminated clothing and wash before re-use.
- If skin irritation occurs, seek medical advice/attention.
- If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- If eye irritation persists, get medical advice/attention.
- If skin irritation occurs, seek medical advice/attention.
- Seek emergency treatment in reference to supplemental first aid instructions.

Other Hazards Which Do Not Result in Classification:
Caution: Do not breathe dust from dried product.
Potential Environmental Effects: None known.
Routes of Exposure: Eye, Skin.
Ingestion: May be harmful if swallowed.
Inhalation: Due to this material's liquid dispersion state, it is not expected to be a significant inhalation hazard. Dried product may cause irritation to the respiratory tract.
Chronic Effects: No components listed as carcinogens by IARC, NTP, Z List or OSHA.
Teratology: None known.
Reproduction Info.: None known.
Target Organs: None known.
Medical Conditions Aggravated: None known.

Section 3. Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS No.</th>
<th>EINECS #</th>
<th>% by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silica, Amorphous</td>
<td>7631-86-9</td>
<td>231-545-4</td>
<td>&lt;3%</td>
</tr>
<tr>
<td>Acetic Acid</td>
<td>64-19-7</td>
<td>200-580-7</td>
<td>&lt;3%</td>
</tr>
<tr>
<td>Ammonium Hydroxide</td>
<td>1336-21-6</td>
<td>215-647-6</td>
<td>&lt;0.5%</td>
</tr>
<tr>
<td>Ethylene Glycol</td>
<td>107-21-2</td>
<td>203-473-3</td>
<td>&lt;6%</td>
</tr>
<tr>
<td>Formic Acid</td>
<td>64-18-6</td>
<td>200-579-1</td>
<td>&lt;3%</td>
</tr>
<tr>
<td>Nitric Acid</td>
<td>7697-37-2</td>
<td>231-714-2</td>
<td>&lt;3%</td>
</tr>
<tr>
<td>Phosphoric Acid</td>
<td>7664-38-2</td>
<td>231-633-2</td>
<td>&lt;3%</td>
</tr>
<tr>
<td>Sulfuric Acid</td>
<td>7664-93-9</td>
<td>231-639-5</td>
<td>&lt;3%</td>
</tr>
<tr>
<td>Proprietary Ingredients</td>
<td>Proprietary</td>
<td>Proprietary</td>
<td>&lt;13%</td>
</tr>
<tr>
<td>De-Ionized Water</td>
<td>7732-18-5</td>
<td>231-791-2</td>
<td>&gt;62%</td>
</tr>
</tbody>
</table>

Section 4. First-Aid Measures

If the substance contacts eyes:
- Immediately flush lightly with plenty of water for at least 15 minutes.
- If symptoms develop seek medical attention.

If the substance contacts skin:
- Flush affected area with water.
- Remove contaminated clothing.
- If symptoms develop seek medical attention.

If the substance is inhaled:
- Remove to fresh air.
- If breathing is difficult, give oxygen.
- If not breathing, give artificial respiration.
- If symptoms develop, seek medical attention.

If the substance is ingested:
Do not induce vomiting.
- If conscious and alert, rinse mouth with water.
- If symptoms develop seek medical attention.

Most Important Symptoms/Effects (Acute and Delayed): Not available.

First aid and Note to Physicians: Treat symptomatically if present.

Section 5. Explosion and Fire-fighting Measures

Suitable Extinguishing Media:
- Use extinguishing media for surrounding fire.
- Unsuitable Media: Not Applicable

Specific Hazards Arising From the Chemical:
- Not Applicable

Specific Protective Equipment and Precautions for Fire Fighters:
- Standard personal protective equipment for structural fire fighting.

Section 6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures:
- Safety glasses or goggles, impervious gloves and protective clothing recommended when handling.
- If spilled material dries, creating airborne dust concentrations that exceed the applicable exposure limit, then an approved respirator for dust/fumes is recommended.

Environment Precautions:
- Do not allow material to surface waters.

Methods and Materials for Containment and Clean-Up:
- Absorb with inert material (e.g., dry sand or earth), then place in chemical waste container.
- Wear appropriate PPE. See Section 8.

Section 7. Handling and Storage

Precautions for Safe Handling:
- Avoid skin and eye contact.
- Avoid generating aerosols or mists.
- Do not breathe aerosols, mists or dust from dried product.

Conditions for Safe Storage, Including Incompatibilities:
- Keep from freezing.

Hygienic Practices:
- Avoid contact with skin.
- Wash exposed skin frequently.
- Good practices should be followed in regard to work clothing.

Section 8. Exposure Controls/Personal Protection

Exposure Limits, Biological Limit Values Etc.:
- TLV (U.S.) = 10 mg/m³ total dust for particles not otherwise classified
- PEL (U.S.) = 10 mg/m³ for nuisance dust. 15 mg/m³ for total dust.
- MAK (Germ.) = 4 mg/m³ inhalable dust.
- OES (U.K.) = 6 mg/m³ total inhalable, 2.4 mg/m³ respirable dust.
- Australia (TLV) = 10 mg/m³ total dust containing no asbestos and <1% crystalline silica.
- Korea: 10 mg/m³ (total dust)

Appropriate Engineering Controls:
- If operations generate dust, fumes or mist, use ventilation to keep exposure to airborne contaminants below exposure limits.

Personal Protective Equipment:

Respiratory Protection:
- None normally needed unless mists or dust are generated.
- An approved air-purifying respirator (APR) for dusts/mists may be appropriate to control exposure. Protection provided by air-purifying respirators is limited. Us a positive-pressure, air supplied respirator if there is any potential for uncontrolled release, exposure levels are not known, or any circumstances where air-purifying respirators may not provide adequate protection. Use of respirators must include a complete respiratory protection program in accordance with national standards and current best practices.
- The following agencies/organizations approve respirators and/or criteria for respirator programs
  - U.S.: NIOSH approved under 42 CFR 84 required.
  - OSHA (29 CFR 1910.134)
  - ANSI Z88.2-1992
  - EU: CR592 Guidelines for the Selection and Use of Respiratory Protection.
  - UK: BS 4275 Recommendations for the Selection, Use and Maintenance of Respiratory Protective Equipment.
  - HSE Guidance Note HS(G)53 Respiratory Protective Equipment.

Eye protection: Safety glasses with side shields or goggles recommended to prevent eye contact.

Hand protection: Impervious gloves.

Body protection: Wear appropriate clothing to minimize skin contact.
Section 9. Physical and Chemical Properties

Appearance: Milky White Slurry.
Odor: None.
Odor Threshold: Not Applicable.

pH: 2.5-4.0
Melting Point/Freezing Point: 0°C / 32°F.
Initial Boiling Point and Boiling Range: 100°C / 212°F.
Flash Point: Not Applicable.
Evaporation Rate: Same as Water.

Flammability (Solid, Gas): Not Applicable.
Upper/Lower Flammability or Explosive Limits: Not Applicable.

Vapor Pressure: Same as Water.
Solubility (Water): Dispersible.
Vapor Density: Same as Water.
Specific Density (Gravity): 1.1 @ 25°C.
Partition Coefficient - N-Octanol/Water: Not Applicable.
Auto-Ignition Temperature: Not Applicable.
Decomposition Temperature: Not Available.
Viscosity: Not Determined.

Section 10. Stability and Reactivity

Chemical Stability: Stable.

Possibility of Hazardous Reactions: Hazardous polymerization will not occur.

Conditions to Avoid: Freezing conditions.

Incompatible Materials: None.

Hazardous Decomposition Products: Nitrogen oxides, CO, CO₂ gases.

Section 11. Toxicological Information

Information on the Likely Routes of Exposure:
- Acute Inhalation Toxicity: Due to this material’s liquid dispersion state, it is not expected to be a significant inhalation hazard. Dried product may cause irritation to the respiratory tract.
- Acute Oral Toxicity: May be harmful if swallowed.
- Skin: Skin irritation.
- Eye: Eye irritation.

Symptoms Related to the Physical, Chemical and Toxicological Characteristics: Not available

Delayed and Immediate Effects and Chronic Effects from Short and Long Term Exposure:

Immediate Effects
- Acute Toxicity: Not available.
- Skin Corrosion/Irritation: Skin irritation.
- Serious Eye Damage/Irritation: Eye irritation.
- Respiratory Sensitization: Not available.
- Skin Sensitization: Not available.
- Carcinogenicity: Not available. No components listed as carcinogens by IARC, NTP, Z List or OSHA.
- Germ Cell Mutagenicity: Not available.
- Reproductive Toxicity: Not available.
- STOST (Single Exposure): Not available.
- STOST (Repeated Exposure): Not available.
- Aquatic Toxicity: Not available.

Chronic Effects
- Chronic Ingestion Effect: None expected.
- Chronic Eye Effect: None expected.
- Chronic Skin Effect: None expected.
- Chronic Inhalation Effect: None known.

Numerical Measures of Toxicity: Not available.
Synergistic Materials: None expected.

Section 12. Ecological Information

Toxicity on Aquatic and Terrestrial Organisms: Not available.
Persistence and Degradability: The oxide component of this material will persist.

Bioaccumulation: This material is not expected to bio-accumulate.
Mobility in Soil: Oxide component not mobile in soil.
Other Adverse Effects: WGK Water Hazard Class - NWG

Section 13. Disposal Considerations

Disposal Methods:
- Dispose of in accordance with all applicable National, State and Local regulations. Same considerations should be given to
Section 14. Transport Information

UN Number: Not applicable
UN Proper Shipping Name: Non-hazardous/Non-Regulated.
Transport Hazard Class: Not applicable.
Packing Group: Not applicable.
Marine Pollutant: Not applicable.
Information on Any Special Precautions: Not applicable.

Section 15. Regulatory Information

National Registries: All components are in compliance with the inventories below
- Australia: AICS Australian Inventory List
- Canada: CEPA, Canadian Environmental Protection Act, 6th Amendment, Domestic Substance List.
- China: Inventory of Existing Chemical Substances in China.
- Europe: EINECS, European Inventory of Existing Commercial Chemical Substances.
- Korea: ECL, Existing Chemical List.

U.S. Regulations
- U.S. Clean Air Act, 1990: No components are listed as hazardous air pollutants. No components contain or are manufactured with Class I or Class II ozone depleting chemicals.
- U.S. Clean Water Act (40 CFR 116): No components are listed.
- U.S. SARA Title III:
  - Section 302: Does not contain any constituents that are identified as extremely hazardous.
  - Section 311/312: Under SARA 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are: 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.
  - Section 311/312 – SDS Requirements – Not regulated.
  - Section 313: Does not contain any of the substances identified under Section 313 as toxic chemicals in excess of the de minimis concentrations necessary to be subject to this rule.
- CERCLA: This material is not a hazardous substance under the CERCLA. Notification of spills of this material is not required.

European Regulations
- Product is not a dangerous substance regarding EU Directive 67/548/EEC and its various amendments and adaptations.

Section 16. Other Information

Sources of Reference Materials:
- SDS has been prepared in accordance with the following:
  - Globally Harmonized System (GHS) of Classification and Labeling of Chemicals.
  - EC Directive 91/155/EEC and 93/113/EEC.

Abbreviations:
- CAS: Chemical Abstract Service.
- PEL: Permissible Exposure Limit.
- PPE: Personal Protective Equipment.
- SARA: Superfund Amendments and Reauthorization Act.
- TLV: Threshold Limit Value

Revision Indicator: Revised sections of the SDS will be indicated by an asterisk (*) in front of the section affected.
- The information set forth is based on information which Cabot Microelectronics Corporation believes to be accurate.
- No warranty, express or implied, is intended. The information is provided solely for your information and consideration.
- Cabot Microelectronics Corporation assumes no legal responsibility for use or reliance thereon.

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Number of Revision Times and Date of Latest Revision: 0
Form: 0208

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