SAFETY DATA SHEET
Semi-Sperse® 12E
Aqueous Dispersion

Section 1. Chemical Product and Company Identification

1.1 Product Identifier
Product Name: Semi-Sperse® 12E Aqueous Dispersion
Date of Preparation: 23 February 2006
Date of Last Revision: 20 April 2015
REACH Registration: Registration numbers for the substances in this mixture are not available. The substance or its uses are exempted; the annual tonnage does not require a registration; or the registration has been allocated for a later registration date.

1.2 Identified Uses
Product Use: Polishing applications in the semiconductor and related industries.
Uses Advised Against: No further relevant information.

1.3 Information on Manufacturer/Supplier
Cabot Microelectronics Corporation(CMC)- United States
870 N. Commons Dr. Aurora, IL 60504, United States
Telephone No.: (MSDS Requests) 630.375.6631,(EHS Technical Information) 630.499.2789,Facsimile No.: 630.375.2082
Email: Kelly_buffey@cabotcmp.com

CMC- Wales
The Business Centre, Cardiff House, Cardiff Road
Barry, Vale of Glamorgan, Wales
CF62 2BG, United Kingdom
Telephone No: 011.441.446.704407

1.4 Emergency Telephone Number:
Chemtrec (U.S.) 800.434.9300 (24 hour)
Chemtrec (Int’l) 703.527.3887 (24 hour)
Chemtrec (UK) +(44)-870-8200418 (24 hour).

Section 2. Hazards Identification

This product does not meet the criteria for classification in any hazard class according to Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures. However a safety data sheet is being supplied for it on request as it may contain a component for which there is a Community workplace exposure limit or Occupational Exposure Limits.

2.1 Classification of the Substance or Mixture according to Regulation (EC) 1272-2008
Classification of the substance or mixture:
Classification according to Regulation (EC) 1272/2008: The substance is not classified according to CLP regulation.

2.2 Label Elements
Labelling according to Regulation (EC) No 1272/2008: Not Applicable
Hazard Pictograms: Not Applicable
Signal Word: Not Applicable
Hazard Statements: Not Applicable

2.3 Other Hazards
Other Hazards Which Do Not Result in Classification:
Caution: Do not breathe dust from dried product.
Potential Environmental Effects: None known.
Routes of Exposure: None identified.
Eye: Rabbit. Mixture tested. No irritation was observed in any eyes at 24, 48, or 72 hours. Non-irritating.
Skin: Rabbit. Mixture tested. No irritation was observed at 24, 48, and 72 hour. Mean score 0.0.
Ingestion: Do not ingest.
Inhalation: Due to this material's liquid state, no hazard is expected. 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.

Results of PBT and vPvB assessment
PBT: Not Applicable
vPvB: Not Applicable

Section 3. Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Hazardous Ingredients</th>
<th>CAS No.</th>
<th>EC No.</th>
<th>% by Weight</th>
<th>Hazard Classification; Risk Phrases</th>
</tr>
</thead>
<tbody>
<tr>
<td>De-Ionized Water</td>
<td>7732-18-5</td>
<td>231-791-2</td>
<td>&gt;87%</td>
<td>Hazard Classification: None</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Risk Phrases: None</td>
</tr>
<tr>
<td>Silica, Amorphous</td>
<td>112945-52-5</td>
<td>231-545-4</td>
<td>12%</td>
<td>Hazard Classification: None</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Risk Phrases: None</td>
</tr>
<tr>
<td>Potassium Hydroxide</td>
<td>1310-58-3</td>
<td>215-181-3</td>
<td>&lt;1%</td>
<td>Hazard Classification: None</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Risk Phrases: None</td>
</tr>
</tbody>
</table>

Balance of other ingredients are non-hazardous or less than 1% in concentration (or 0.1% for carcinogens, reproductive toxins, skin or respiratory sensitizers and germ cell mutagens).

REACH Registration: Registration numbers for the substances in this mixture are not available. The substance or its uses are exempted; the annual tonnage does not require a registration; or the registration has been allocated for a later registration date.

Section 4. First-Aid Measures

4.1 Description of 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.

4.2 Most Important Symptoms/Effects (Acute and Delayed) Not available.
4.3 Indication of any Immediate Medical Attention and Special Treatment Needed
First aid and Note to Physicians: Treat symptomatically if present.

Section 5. Explosion and Fire-fighting Measures

Flashpoint: Not Flammable; No Flashpoint
5.1 Extinguishing Media
Suitable Extinguishing Media:
   As appropriate for surrounding fire. Carbon dioxide, foam, dry chemical, halon, or water spray.
Unsuitable Media: Not Applicable.
5.2 Special Hazards Arising from the Substance or Mixture: Not Applicable.
5.3 Advice for Firefighters
Specific Protective Equipment and Precautions for Fire Fighters:
   Standard personal protective equipment for structural firefighting.

Section 6. Accidental Release Measures

6.1 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.
6.2 Environmental Precautions
   Do not allow material to surface waters. Environmental manager must be informed of all major spillages.
6.3 Methods and Materials for Containment and Clean-Up
   Absorb with inert material (e.g., dry sand or earth), then place in chemical waste container.
6.4 Reference to Other Sections
   Wear appropriate PPE. See Section 8.

Section 7. Handling and Storage

7.1 Precautions for Safe Handling
   Avoid skin and eye contact. Avoid generating aerosols or mists. Do not breathe aerosols, mists or dust from dried product.
7.2 Conditions for Safe Storage, Including Incompatibilities
Keep from freezing.

7.3 Specific end use(s)
No further relevant information available.

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

8.1 Control Parameters

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS No.</th>
<th>Country</th>
<th>Values</th>
<th>Exposure Limit / Biological Limit Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silica, Amorphous</td>
<td>112945-52-5</td>
<td>Germany</td>
<td>MAK</td>
<td>4 mg/m³ inhalable dust</td>
</tr>
<tr>
<td>Silica, Amorphous</td>
<td>112945-52-5</td>
<td>UK</td>
<td>TWA</td>
<td>6 mg/m³ inhalable dust; 2.4 mg/m³ respirable dust</td>
</tr>
<tr>
<td>Potassium Hydroxide</td>
<td>1310-58-3</td>
<td>UK</td>
<td>TWA</td>
<td>2 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Italy</td>
<td>TWA</td>
<td>2 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>France</td>
<td>TWA</td>
<td>2 mg/m³</td>
</tr>
</tbody>
</table>

8.2 Exposure controls

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. Use 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/o 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

9.1 Information on Basic Physical and Chemical Properties
Appearance and Physical State: Dispersion and Milky White Slurry
Odor: None.
Odor Threshold: Not Applicable.

pH: 10.9-11.2
Melting Point/Freezing Point: 0°C / 32°F.
Initial Boiling Point and Boiling Range: 100°C / 212°F.
Flash Point: Not Flammable; No Flashpoint.
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): 1.166 @ 25°C.
Partition Coefficient- N-Octanol/Water: Not Applicable.
Auto-Ignition Temperature: Not Applicable.
Decomposition Temperature: Not Available.
Viscosity: Not Determined.
Explosive Properties: Not Applicable.
Oxidizing Properties: Not Applicable.

9.2 Other Information
Section 10. Stability and Reactivity

10.1 Reactivity: No Reactivity
10.2 Chemical Stability: Stable.
10.3 Possibility of Hazardous Reactions: Hazardous polymerization will not occur.
10.4 Conditions to Avoid: Freezing conditions.
10.5 Incompatible Materials: None.
10.6 Hazardous Decomposition Products: None known.

Section 11. Toxicological Information

Information on the Likely Routes of Exposure:
- Acute Inhalation Toxicity: Due to this material's liquid state, no hazard is expected. Dried product may cause irritation to the respiratory tract.
- Acute Oral Toxicity: Do not ingest.
- Skin: Non-irritating based on results of testing of the product.
- Eye: Non-irritating based on results of testing of the product.

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

11.1 Information on Toxicological Effects
11.2 Delayed and Immediate Effects and Chronic Effects from Short and Long Term Exposure:

Immediate Effects
- Acute Toxicity: Not available.
- Skin Corrosion/Irritation: Rabbit, Mixture, 24, 48, 72 hr. Non-irritating. Mean score 0.0.
- Serious Eye Damage/Irritation: Rabbit Mixture, 24, 48, 72 hr. Non-irritating. Mean score 0.0.
- 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.
- STOT (Single Exposure): Not available.
- STOT (Repeated Exposure): Not available.
- Aspiration: 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

12.1 Toxicity on Aquatic and Terrestrial Organisms: Not available.
12.2 Persistence and Degradability: The oxide component of this material will persist.
12.3 Bioaccumulation: This material is not expected to bio-accumulate.
12.4 Mobility in Soil: Oxide component not mobile in soil.
12.5 Results of PBT and vPvB Assessment: Not Applicable.
12.6 Other Adverse Effects: No further relevant information available.

Section 13. Disposal Considerations

13.1 Disposal Methods
Dispose of in accordance with all applicable National, State and Local regulations. Same considerations should be given to the disposal of empty containers.

Precautions for Disposal: Not available

Section 14. Transport Information

14.1 UN Number (ADR, IMDG, IATA): Not applicable
14.2 UN Proper Shipping Name (ADR, IMDG, IATA): Non-hazardous/Non-Regulated.
14.3 Transport Hazard Class (ADR, IMDG, IATA): Not applicable.
14.4 Packing Group (ADR, IMDG, IATA): Not applicable.
14.5 Environmental hazards:
- Marine Pollutant: No
14.6 Special Precautions for User: Not applicable
14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable.

Section 15. Regulatory Information

15.1 Safety, Health and Environmental Regulations/Legislation. Specific for the Substance or Mixture
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.
Japan: METI, Ministry of Economy, Trade and Industry List of Existing and New Chemical Substances (ENCS).
Korea: ECL, Existing Chemical List.

WGK Water Hazard Class: NWG

15.2 Chemical Safety Assessment: No chemical safety assessment has been carried out.

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 (4th Revision).

Toxicology Testing:

Abbreviations:
ADR: European Agreement concerning the International carriage of Dangerous Goods by Road
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
EINECS: European Inventory of Existing Commercial Chemical Substances.
GHS: Globally Harmonized System of Classification and Labelling of Chemicals.
CAS: Chemical Abstract Service.
NIOSH: National Institute of Occupational Safety & Health.
PEL: Permissible Exposure Limit.
PPE: Personal Protective Equipment.
TLV: Threshold Limit Value
UN: United Nations.

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.

*Internal Use Only-GHS Hazard Classification “No Hazard”*

Date Prepared: 23 February 2006       Date Issued: 20 April 2015       Prepared By: Kelly Buffey, Product Stewardship Coordinator Kelly_Buffey@cabotcmp.com

Number of Revision Times and Date of Latest Revision: 1

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