CATAPOSIT™ 449 Replenisher for CATAPOSIT 44 Catalyst
For PWB Metallization Application

Regional Product Availability
- Asia-Pacific
- Japan / Korea

Description
CATAPOSIT™ 44 Catalyst is a patented, tin-palladium colloidal catalyst that is specially formulated to seed the non-conductive surfaces of printed circuit boards for complete and uniform deposition of Dow Electronic Materials CUPOSIT™ and CIRCUPOSIT™ Electroless Copper products. It is a mildly acidic, chloride-containing catalyst, that is non-volatile and non-fuming.

CATAPOSIT 449 Replenisher is specifically formulated to replenish the catalyst bath when the stannous tin concentration falls below the recommended control range. This may result from a very low loading factor in the CATAPOSIT 44 Bath or in horizontal process applications.

Advantages
- Promotes complete, uniform electroless copper deposition
- Promotes excellent adhesion of electroless copper to both copper and non-conductive surfaces
- Minimal lateral attack on copper oxides
- Steady-state operation facilitates consistent performance and long bath life
- Wide operating latitude

Bath Control and Replenishment
The CATAPOSIT™ 44 Catalyst Bath is maintained through the measurement and control of Catalyst bath strength and stannous chloride content, and may be monitored for specific gravity, (refer to the CATAPOSIT 44 Catalyst data sheet for additional information on the CATAPREP™ 404 Pre-dip Bath and the CATAPOSIT 44 Catalyst Bath.)

The CATAPOSIT 44 Catalyst Bath may be analyzed for Catalyst bath strength by either of two methods: the Dow Electronic Materials Comparator or a spectrophotometric analysis. Each of these methods is included at the end of this document. Following the bath strength analysis, make the addition of CATAPOSIT 44 Catalyst Concentrate indicated in the following table. Maintain catalyst bath strength between 90–100%.

| CATAPOSIT™ 44 Catalyst Addition 100 liter 1.5 vol% Bath |
|-----------------|-----------------|
| Bath Strength   | CATAPOSIT™ 44 Catalyst Concentrate |
| 110%            | —               |
| 100%            | —               |
| 90%             | 0.15 liters     |
| 80%             | 0.30 liters     |
| 70%             | 0.45 liters     |
| 60%             | 0.60 liters     |

UNRESTRICTED – May be shared with anyone
Bath Control and Replenishment (Continued)

The CATAPOSIT™ 44 Catalyst Bath should be periodically monitored for stannous chloride content. This analysis should be performed if the bath has been idle for an extended period of time or if the workload has been light, and only after the bath strength has been adjusted. Under ordinary conditions, the stannous tin concentration will be maintained between 3 and 8 g/l, through regular additions of CATAPOSIT 44 Catalyst Concentrate.

In some situations, the stannous tin will drop below the 3 g/l lower limit. CATAPOSIT 449 Replenisher may be used to maintain the stannous chloride concentration in the range 3–8 g/l by making additions of as directed below.

### CATAPOSIT™ 449 Replenisher Addition 100 liter

<table>
<thead>
<tr>
<th>Stannous Chloride content (g/l)</th>
<th>CATPOSIT™ 449 Replenisher Addition</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.0</td>
<td>—</td>
</tr>
<tr>
<td>5.0</td>
<td>—</td>
</tr>
<tr>
<td>4.0</td>
<td>0.29 liters</td>
</tr>
<tr>
<td>3.5</td>
<td>0.43 liters</td>
</tr>
<tr>
<td>3.0</td>
<td>0.57 liters</td>
</tr>
<tr>
<td>2.5</td>
<td>0.71 liters</td>
</tr>
</tbody>
</table>

### Stannous Chloride Control Procedure

**I. Principle**

The stannous chloride in the bath is titrated with iodine using starch indicator.

**II. Reagents**

a) Iodine solution, 0.10N standardized

b) Hydrochloric acid, 25% by volume

c) Starch indicator (1%)

d) Degassed water: use freshly distilled or boiled deionized (D.I.) water

**III. Procedure**

a) Pipette 10 ml of CATAPOSIT™ 44 Catalyst Bath into a 250 ml Erlenmeyer flask.

b) Add 75 ml of 25% hydrochloric acid and dilute to approximately 150 ml with degassed water.

**WARNING!** Proper care must be taken to avoid physical contact with hydrochloric acid solution as severe burns can result. The use of proper safety equipment is necessary, including chemical goggles, chemical gloves, and suitable protective clothing.

c) Add 5 ml of starch indicator and titrate with iodine (0.10N) to the blue-black end point.

**IV. Calculation**

\[
g/l \text{ SnCl}_2 = \frac{\text{ml Iodine} \times \text{Normality (0.10)} \times 94.8}{\text{aliquot (10 ml)}}
\]
**Equipment**

- Tanks: Polypropylene, polyethylene, or PVC
- Racks: 316 stainless steel, polyethylene, polypropylene, or PTFE-coated
- Heaters: Tantalum or PTFE-coated
- Filtration: Polypropylene or dynel

**IMPORTANT!** Do not use other materials such as iron, steel, aluminum, magnesium, lead, zinc or cadmium.

**Product Data**

**CATAPOSIT™ 449 Replenisher**

- **Description:** Non-flammable, acidic liquid
- **Specific Gravity:** 1.3 (approximately)
- **Palladium:** 0.15 g/l as Pd metal (approximately)
- **Stannous Chloride:** 350 g/l as SnCl₂ (approximately)
- **Appearance:** Dark brown
- **Turbidity:** Non-turbid
Handling Precautions

Before using this product, or the analytical reagents required for its control, consult the Material Safety Data Sheet (MSDS)/Safety Data Sheet (SDS) for details on material hazards, recommended handling precautions and product storage.

CAUTION! Keep combustible and/or flammable products and their vapors away from heat, sparks, flames and other sources of ignition including static discharge. Processing or operating at temperatures near or above product flashpoint may pose a fire hazard. Use appropriate grounding and bonding techniques to manage static discharge hazards.

CAUTION! Failure to maintain proper volume level when using immersion heaters can expose tank and solution to excessive heat resulting in a possible combustion hazard, particularly when plastic tanks are used.

Storage

Store products in tightly closed original containers at temperatures recommended on the product label.

Disposal Considerations

Dispose in accordance with all local, state (provincial) and federal regulations. Empty containers may contain hazardous residues. This material and its container must be disposed in a safe and legal manner.

It is the user’s responsibility to verify that treatment and disposal procedures comply with local, state (provincial) and federal regulations. Contact your Dow Electronic Materials Technical Representative for more information.

Product Stewardship

Dow has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our product stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with Dow products - from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

Customer Notice

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