

## ACTI/Plate DM-60A

### A Post Treatment Process to Stabilize the Palladium Colloid Catalyst

#### Product Description

ACTI/Plate DM-60 Stabilizer (DM-60) was designed to increase the conductivity of dielectric substrates previously treated with DM-50, and improve the stability of the colloidal deposit during photo processes encountered prior to copper plating. DM-60 produces a uniform immersion copper layer upon the previously absorbed palladium catalyst, thereby stabilizing the conductivity site. ACTI/Plate DM-60 assures a dense, highly conductive and stable deposit on both glass and epoxy surfaces; including difunctional, multifunctional, polyimide, and Teflon substrates.

#### Performance Features

- ACTI/Plate DM-60 effectively stabilizes the absorbed catalyst during post processing procedures prior to copper electroplating.
- ACTI/Plate DM-60 is supplied as an economical two-part concentrate.
- ACTI/Plate DM-60 enhances formation of a dense, conductive, and stable colloidal deposit in a single pass; allowing for photo processing without copper flash plating.

#### Physical Specifications

Parameter	DM-60A	DM-60B
Physical State	Solid	Liquid
Appearance	Granular Powder	Blue Solution
Odor	Odorless	Odorless
Freeze/Thaw Stability	Stable	Stable
Specific Gravity	2.4	1.2
pH	>9 (1% Solution)	< 1
Flash Point	None	None

#### Equipment Requirements

Tanks: Constructed or Lined with Scratch Free CPVC Or Polyethylene.

Heaters: Constructed Of Quartz Or Teflon.

Racks: Constructed or Lined with Hynel Or Plastisol Coated Steel.

Agitation: Mechanical Agitation Combined With Continuously Recirculated Filtering, Employing Filter Media Appropriate For Hot Alkaline Solutions.

Filtration: Required, 1-5 Micron Continuous.

## Technical Data Sheet

### Product Make-Up

ACTI/Plate DM-60 is a two-part concentrate consisting of DM-60A (solid) and DM-60B (liquid). To prepare a working bath of ACTI/Plate DM-60, follow the procedure below.

#### Procedure

1. Thoroughly rinse the tank and inspect for cleanliness, paying special attention to the heaters and heater sheathings.
2. Fill the clean process tank with deionized water to 75% of the desired working level.
3. Heat the water to 145°F, and add 3 pounds/gallon (360 g/L) of ACTI/Plate DM-60A. Mix until completely dissolved.
4. Dilute with deionized water to 90% of the final tank volume.
5. SLOWLY and with agitation, add 15 ml/gallon (4 ml/L) of ACTI/Plate DM-60B. (Make sure to use the final volume of make-up to determine the proper volume of ACTI/Plate DM-60B to add.)
6. Fill to level with deionized water and mix utilizing solution filtration.
7. Heat the solution to 145°F while continuously maintaining adequate solution agitation.
8. Keep tank covered to prevent evaporation of water or introduction of contaminants when not in use.

### Operating Parameters

Concentration	DM-60B Is Employed At 15 ml/gallon. DM-60A Is Employed At 3 Pounds Per Gallon.
Temperature	140 - 150°F (145°F Optimum)
Application Method	Immersion Or Flood
Time	5 - 10 Minutes Depending On Agitation.

NOTE: To minimize water evaporation and prevent unnecessary contamination, cover the ACTI/Plate DM-60 Stabilizer solution when not in use.

### Control Replenishment

Chemical Additions	Additions Can Be Made Based Upon Laboratory Determination Of The DM-60A (360 G/L) And Copper Concentration (80 - 100 mg/L). Additions Of DM-60A Are Made To Maintain Concentration (Thereby Buffering The Bath) And DM-60B To Increase The Copper Concentration. The Ph Of A Working Bath Should Be Periodically Checked And Maintained Between 11.5 - 11.7.
Bath Life Expectancy	1,000 Ft <sup>2</sup> Of Work Can Be Processed Per Gallon Of Working Bath. Discard The Bath Once Per Month Or After 1,000 Surface Ft <sup>2</sup> Of Work Has Been Processed; Whichever Comes First.

NOTE: Make up for evaporation with deionized water .

## Technical Data Sheet

### **Measuring the Concentration of ACTI/Plate DM-60A**

The grams per liter of ACTI/Plate DM-60A in a working bath can be measured using the procedure below.

Equipment Required	Reagents Required
Buret, 50 ml	Hydrochloric Acid Standardized 1.0 N
Erlenmeyer Flask, 250 ml	Methyl Orange Indicator
Pipet, 5 ml	

#### *Procedure*

1. Pipet a 5 ml of sample of bath into a 250 ml Erlenmeyer flask containing 50 ml of deionized water.
2. Add approximately 10 drops of methyl orange indicator and mix.
3. Begin titrating with the standardized hydrochloric acid from a clear orange to a clear red endpoint. Record the mls of titrant required to reach the endpoint.

Calculation 
$$\frac{A \times B \times 58.5}{C} = \text{g/L ACTI/Plate DM-60A}$$

Where            A        =        mls of titrant used  
                      B        =        N of titrant (1.00)  
                      C        =        sample volume in mls (5.0)

To make additions, add ACTI/Plate DM-60A on a gram per liter basis to increase concentration to 360 g/L.

### **Measuring the Concentration of Copper in an ACTI/Plate DM-60 Working Bath**

The copper concentration in a working bath of ACTI/Plate DM-60 can be measured using the procedure below.

Equipment Required	Reagents Required
Atomic Absorption Spectrophotometer	Nitric Acid, ACS Grade
Volumetric Flask, 100 ml	AA Copper Standards 1, 2, And 5 mg/L
Pipet, 5 ml	

#### *Procedure*

1. Pipet a 5 ml of sample of bath into a clean, dry 100 ml volumetric flask.
2. Add nitric acid drop wise (approximately 10 - 20 drops) until the observed gassing of the sample has ceased.
3. Dilute to volume with deionized water and measure the copper concentration via atomic absorption.

## Technical Data Sheet

### Calculation

$$A \times 20 = \text{mg/L copper}$$

Where A = mg/L of copper measured in the diluted sample

To increase the copper concentration, calculate the amount of ACTI/Plate DM-60B to add using the following calculation.

$$\frac{(105 - B) \times C \times 3,785}{26,442} = \text{ml of ACTI/Plate DM-60B to add}$$

Where B = mg/L of copper in the working bath  
C = bath volume in gallons

NOTE: Before adding ACTI/Plate DM-60B to replenish the copper, you must measure and make any necessary additions of ACTI/Plate DM-60A.

### Safety and Handling

Read and understand this products MSDS before handling.

### Waste Treatment

Individual users should verify the nature of spent solutions to assure compliance with local, state, and federal regulations. Contact Seacole for specific details and/or further waste treatment recommendations.

### Ordering Information

ACTI/Plate DM-60A is available in 50# pails.

13505 Industrial Park Blvd. Plymouth, MN 55441