Seacole Specialty Chemical

Technical Data Sheet

PC-450CSG

A Stabilized, Hard Water Inhibited, Developer Concentrate

Product Description

PC-450CSG is a carbonate based, liquid developer concentrate for developing fully or semi aqueous dry films and/or liquid photoimagable solder masks. PC-450CSG contains a chemical stabilizer, and hard water inhibitor. Unlike conventional hard water inhibitors, the inhibitor in PC-450CSG will not complex or chelate heavy metals, reducing waste treatment concerns. Additionally, the inhibitor will reduce dulling of fused solder in LPISM developing processes.

This economical concentrate can be employed in manual or automated replenishment systems. When used in combination with Seacole's PC-AUTO/Controller and Dosing Device, the PC-Series Developer Concentrates have been proven to increase bath life by 20% over conventional developers. The PC-AUTO/Controller will automatically make additions of developer concentrate and water, maintaining the pH at +/- 0.02 pH units and the carbonate concentration at +/- 0.03% by weight, resulting in predictable developing quality without adjusting the conveyor speed.

Performance Features

- PC-450CSG is formulated with a unique hard water scale inhibitor which will not dull fused solder during LPI solder mask processing.
- PC-450CSG is compatible with virtually all type of aqueous and semi aqueous dry films and LPI solder masks.
- PC-450CSG is stabilized, improving process consistency and improving bath life up to 20%.

Physical Specifications

Physical State	Liquid
Appearance	Transparent Solution
Odor	Odorless
Stability	Stable
Specific Gravity	1.34
pH	> 11

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Equipment Requirements
Tanks: Constructed Of Polypropylene, Polyethylene, PVC Or CPVC.
Heaters: Quartz, Titanium, Stainless Steel, Or Teflon Encased Steel.
Racks/Baskets: Constructed of Polyethylene, Polypropylene, Stainless Steel Or Plastisol Coated Steel.
Cooling Coils: Polyethylene, Polypropylene, Teflon, Stainless Steel Or Plastisol Coated Steel.
Ventilation: Recommended
Agitation: Spray Processing May Require The Addition Of Anti-Foam. A Nonpetroleum-Based Anti-Foam Such As Seacole's Anti/Foam CR-98S Is Recommended.
Filtration: Continuous Filtration Is Recommended.

Product Make-Up
PC-450CSG must be diluted prior to use. The following procedure is recommended.

Procedure
1. Thoroughly rinse the tank and inspect for cleanliness paying special attention to the heaters and heater sheathings, and cooling coils. (If necessary, employ EQUIPMENT/Cleaner 60 to thoroughly clean the tank.)
2. Fill the tank half full with deionized water. Add PC-450CSG concentrate such that after final dilution the concentration 2.22% by volume. Fill the tank to operating level with deionized water.
3. Very the potassium carbonate concentration by employing the test method described in this data sheet.
4. Turn on heaters and verify temperature with a thermometer.

NOTE: To assure optimum performance, it is recommended deionized or distilled water be used to dilute PC-450CSG.

Operating Parameters
PC-450CSG should be operated within the specifications of your dry film and/or LPI solder mask supplier. Typically, these specifications are as follows:

Potassium Carbonate Concentration	0.90 - 1.00% By Weight (2-2.2 % By Volume)
Temperature	85 - 110°F
Dwell Time	30 - 150 Seconds (To Maintain 50% "Break")

Control and Replenishment

BATCH DUMP PROCESSING

Make-up a new bath at the desired concentration and measure the pH. The pH of a new bath should be 11.0 - 11.6 depending upon sump cleanliness and water quality. During operating, periodically measure the pH of the bath. The bath should be dumped when the pH drops below 10.3 pH units.

AUTOMATED FEED AND BLEED PROCESSING

Only two variables, the pH and percent by weight (%w/w) total carbonate require control during processing. It is recommended the pH be maintained between 10.70 - 10.75. This is most effectively accomplished by employing an automated feed and bleed pH control system. It is unnecessary to dump the bath except during routine equipment maintenance, eliminating frequent bath make-ups and heat-up time. Additionally, because the pH is held constant (+/- 0.025 pH units), it is unnecessary to continually adjust conveyor speed to control the break point.

Measuring the Percent by Weight Total Carbonate

The percent by weight (% w/w) of PC-450CSG in the working bath or diluted feed line can be calculated using the procedure below.

Equipment Required	Reagents Required
Buret, 50 ml	Methyl Orange Indicator
Erlenmeyer Flask, 250 ml	Hydrochloric or Sulfuric Acid - Standardized .10N
Pipet, 50 ml	

Procedure

1. Pipet 50 ml of sample into a 250 ml Erlenmeyer flask containing approximately 50 ml of deionized water.
2. Add approximately 10 drops of indicator and titrate with standardized acid from an orange to a red endpoint. Record the mls of titrant required to reach the endpoint.

Calculation

$$\frac{A \times B \times C}{2 \times D} = \text{g/L potassium carbonate}$$

NOTE: The g/L total carbonate divided by 10 equals % w/w total carbonate!

Where
- A = Volume of titrant required in ml
- B = N of the titrant
- C = M.W. potassium carbonate (138.2)
- D = Sample volume in ml

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

PC-450CSG is available in 5 gallon pails, 55 gallon drums, and 275 gallon totes.

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