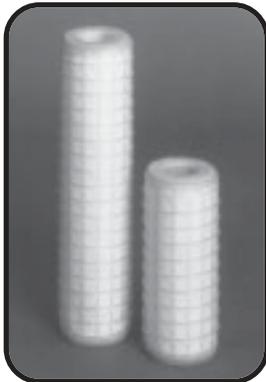




## FLO KING IN-TANK PURIFICATION METHODS

Here are three **Flo King** solution purification products to help platers, printed circuit board manufacturers, and other finishers remove organic impurities without the mess, downtime, and associated problems of conventional batch carbon treatment.



### FLO KING HIGH-FLOW CARBON CARTRIDGES

*(Recommended for tanks from one to several hundred gallons)*

Excellent for continuous “polishing” or occasional periodic treatment. Made of 100% polypropylene, with no materials of construction to deteriorate in solution. Exclusive pelletized carbon and high flow promote fast, efficient removal of impurities. Several lengths and two diameters available (standard 2-1/2" and Jumbo 4"). *See Bulletin 28.2 for details.*

**FKC4**—4" long (10 cm) **FKC6**—6" (15 cm) **FKC10**—10" (25 cm)  
**FKC15**—15" (38 cm) **FKC20**—20" (50 cm) **FKC30**—30" (75 cm)  
Jumbo (4" diameter): **JFKC10**—10" **JFKC15**—15" **JFKC20**—20"



### FLO KING IN-TANK CARBON/RESIN CANISTERS

*(Recommended for tanks from 50 gallons to thousands of gallons)*

Reusable Carbon/Resin Canisters are made of a porous polypropylene tube with internal filter cartridge. Add pelletized carbon to capture organic impurities or fill with ion-exchange resin to remove metallics. Sturdy tube construction provides long-term durability and facilitates refills. Available in lengths of 6, 10, 15 and 20" (15, 25, 38 and 50 cm) and in diameters of 4-1/2 and 7" (11-1/2 and 18 cm). Carbon capacity ranges from 1 to 9 lb (0.45 to 9 kg). *See Bulletin 28.4 for details.*



### FLO KING IN-TANK CARBON BAGS

*(Recommended for tanks from hundreds to thousands of gallons)*

In-tank carbon bags come in three lengths with the capacity to hold 5, 7.5 and 10 pounds (2.3, 3.5 and 4.5 kg) of **Flo King** pelletized carbon. Use standard disposable bag or Permacore™ reusable bag, which can be emptied, cleaned, refilled with carbon, and reused. Sizing guidelines follow.\* *See Bulletin 28.5 for details.*

<b>10"-long bag (25 cm)</b>	<b>15"-long bag (38 cm)</b>	<b>20"-long bag (50 cm)</b>
Up to 1,000 gal (3,785 liters)	1,000 to 1,500 gal (3,785 to 5,700 liters)	1,000 gal and larger (3,785 liters and up)

\* Recommendations concerning tank sizes are guidelines only. Individual needs vary widely.



## FLO KING IN-TANK SOLUTION PURIFICATION

Many electroplating solutions require purification because of brightener breakdown, drag-in of organic contaminants, deterioration of maskants and photoresists, surface contamination, etc. Organic contamination has an adverse effect on the plating process, resulting in pitting, peeling, blistering, high stress, and overconsumption of brighteners. Contamination also results in organically saturated particulates that can build up in the tank as sludge.

Sludge must be removed manually or by filtration using the appropriate filter cartridges prior to carbon treatment. Since the sludge contains a high percentage of organic impurities, sludge removal reduces the time and amount of carbon required for treatment. It also prevents the carbon from being coated with sludge before it has had the chance to adsorb the organic impurities. Do not attempt to “filter” a bath with a carbon treatment device. The purpose of the carbon is to remove organic impurities—not particulates and sludge. Always use **Flo King** Magnum reusable or Poly-Spun disposable filter cartridges before carbon treatment.

Continuous filtration with a **Flo King** in-tank filter system is strongly recommended to *maintain* solution cleanliness by preventing sludge buildup. In-tank filtration, with its unique counterflow agitation motion (see Bulletin 12), also reduces the need for purification by removing particulates before they become saturated with organic impurities.

Using the **Flo King** system, you will find that the old method of transferring solutions from production plating tanks for batch treatment of impurities can be significantly reduced or even eliminated!

### THE OLD METHOD

Many plating solutions require filtration and purification when initially prepared. Thereafter, most require continuous filtration and periodic carbon treatment. This is especially true of the bright plating processes.

The old method is to transfer plating solutions from production tanks to holding tanks or through external chambers for the removal of organic contaminants. Two approaches are common:

**Method 1.** Pump solution to holding tank. Add 1 to 4 pounds of activated carbon per 100 gallons of plating solution (0.5 to 1.8 kg/379 L), depending, of course, on the degree of contamination. This method can be messy, labor-intensive, and costly, resulting in downtime, solution losses and sludge buildup on the tank bottom.

**Method 2.** Continually circulate bath through out-of-tank chamber with 1/2 to 3 pounds of activated carbon per 100 gallons of solution (0.2 to 1.4 kg/379 L). One limitation is filter area available, as the carbon should be restricted to about 3 ounces per square foot (900 mg/cm<sup>2</sup>) of filter area. This procedure is also prone to leaks and spills and often involves downtime, tools and significant labor.

### THE NEW METHOD

Before carbon treatment, thorough solution filtration is imperative. This should be done using a **Flo King** in-tank filter system and our Magnum reusable or Poly-Spun disposable filter cartridges. Twenty or more bath turnovers generally will produce a solution suitable for carbon treatment (see Bulletin 24). Failure to filter properly can result in clogging of both the carbon and the selected carbon treatment attachment—cartridge, canister or bag.

Each attachment is easily and quickly connected to the **Flo King** pump using hand-tightening screws. The carbon-containing attachment is then immersed in the solution to be treated and the pump turned on until Hull Cell or other tests show that the adverse effects of organic contaminants have been eliminated.

In-tank purification can decrease treatment time considerably. What used to take days can often be accomplished in hours and in many cases without interrupting the production operation.

In-tank purification is also cost effective. Equipment, material, and labor costs are low compared with the old method. In summary, the **Flo King** in-tank method is a sensible, time-saving, cost-cutting, and effective alternative.

