



CAUTION!

Do not attempt to carbon treat a solution before you have thoroughly filtered it! This almost certainly will result in poor carbon performance and possibly plugging of your carbon cartridge!

Follow this procedure ...

Using Flo King Magnum MCA Reusable or FK50 Poly-Spun Disposable Filter Cartridge in the appropriate length (see Catalog Bulletins 24 and 26), filter until the solution is clean or until the cartridge clogs. Inspect the cartridge for solids accumulation and also observe movement in the tank. When the pump produces little or no solution movement, the filter cartridge has likely clogged. At this point, change or clean the filter cartridge and continue filtering until the cartridge is able to run several hours without plugging up. Ten bath turnovers using the above cartridges generally removes particles down to 10-15 microns; 20 turnovers typically results in even finer removal. Now you're ready to carbon treat.

Note: If there are a lot of solids, it may be necessary to DE-SLUDGE your tank before carbon treatment (see Flo King Bulletin 27.1).

Precautionary Procedure to Avoid Introduction of Carbon Dust to Solution

Under normal circumstances, carbon cartridges will not introduce appreciable carbon dust to the solution being treated. However, rough shipping and handling or even reactions with certain chemical solutions could cause a small amount of carbon dust to be expelled when the cartridge is first used. *Caution: Carbon dust is very fine and can cause roughness on parts. Complete removal of large amounts of carbon dust can generally be achieved only with an out-of-tank filter system and cartridges pre-coated with Filter Aid (diatomaceous earth slurry).* The following procedure is therefore strongly suggested as a precaution prior to using carbon cartridges.

1. Insert Filter Plug into one end of carbon cartridge. (*Order number for pack of 12 replacement Lightweight Blue Polyethylene Filter Plugs is CFP12.*)

2. Insert opposite end of carbon cartridge into pump body and secure cartridge to pump by hand-tightening Filter Screws. (*Caution: Do not over-tighten Filter Screws.*)

3. Immerse cartridge in tank or other vessel containing clean water for about 1 minute to saturate carbon pellets.

4. Turn pump on for about 30 seconds. During this time, some carbon dust may be expelled into the water. After 30 seconds, turn pump off and slowly remove pump and cartridge from water.

4a. Optional: Immerse carbon cartridge in small vessel (for example, 5-gallon bucket) of solution to be carbon treated for 5 minutes. Do not turn pump on. In some cases, gassing caused by contact of carbon with solution to be treated will cause some dusting.

5. Turn pump on. Little or no carbon dust should enter tank at this point. If a small amount of carbon dust is released in solution, continue to carbon treat. The carbon cartridge and Flo King Filter System generally will retrieve the carbon dust in a short time.



Why is Carbon Treatment Necessary?

Organic impurities are a fact of life in many metal-finishing facilities. In the case of electroplating, these organic impurities may cause pitting, peeling, blistering, highly stressed deposits, high brightener consumption and other problems.

Organic impurities are introduced to solution in several ways. Common sources include drag-in of contaminated rinsewater, airborne contaminants, and brightener breakdown products. Among the frequently encountered organic impurities are: oil, grease, drawing compounds, lubricants, buffing compounds, masking agents, and cleaner and acid wetter drag-in. Over-additions of intentionally added chemicals are another source of organic contamination.

These organic impurities are often soaked up by solids—particles, sediment or sludge—that have been allowed to accumulate in the process bath. So it is only logical that filtration of these solids will result in the removal of a high percentage of organic impurities as well. That means less carbon and less time will be needed for carbon treatment, and that removal of valuable brighteners and wetting agents will be minimized.

Warning! Failure to filter large solids from solution before carbon treatment will clog the carbon treatment device (Cartridge, Bag or Canister) before it has had the chance to remove organic impurities. Continuous or periodic filtration using a **Flo King** In-Tank Filter System is recommended to prevent sludge from accumulating and to reduce the buildup of organic impurities.

Regular in-tank treatment using **Flo King** carbon products can minimize or even eliminate the need for batch carbon treatment—the traditional method of transferring solutions from production plating tanks to holding tanks and adding powdered carbon to remove organic impurities.

How Often and How Long?

Bright nickel and acid copper plating typically require frequent carbon treatment. But other solutions may need only occasional treatment or none at all.

Most platers conduct Hull Cell tests to detect the onset of plating problems, such as loss of deposit brightness. At the first sign of trouble, they implement carbon treatment.

A good preventive maintenance schedule can usually be established based on Hull Cell test results. Some platers have learned from experience that they need to carbon treat once a week or once a month, for example.

A typical carbon treatment lasts four to 24 hours. However, results vary, depending on the severity of contamination, and some processes may require longer treatment times or even continuous carbon treatment.

After a single treatment, the carbon is often saturated with organics (“spent”) and should be properly disposed of. How do you know if the carbon is totally spent? Unfortunately, there is no simple way to test the carbon and make this assessment. Most practitioners therefore rely on Hull Cell tests and experience, though a few have expensive ion chromatography or other analytical equipment to help determine when fresh carbon is required.



Optional: Continuous Carbon Treatment

Some platers use processes that may require filtration to remove particulates (dirt) and continuous carbon “polishing” to prevent the buildup of organic impurities. This can sometimes be accomplished using a single **Flo King** BX650, BX1200, BX3000, BX5000, BXL2500 or BXL5000 along with a Double Cartridge Holder (DCH), Quad Cartridge Holder (QCH), or Extended Double Cartridge Holder (DCHE). See these Multiple Cartridge Holders on Bulletin 18 in our catalog. Examples:

- **Carbon Cartridge with Filter Cartridge:** Use a carbon cartridge on one side of the DCH and a filter cartridge on the other. Or use two filter cartridges and two carbon cartridges on a Quad Cartridge Holder.
- **Carbon Bag with One Filter Cartridge:** Use a DCHE with Carbon Bag on one side and filter cartridge on the other.
- **Carbon Bag with Two Filter Cartridges:** Use a Carbon Bag on one side of a DCHE. On the other side, install a DCH equipped with two filter cartridges.

The carbon treatment attachment can be disposed of or replenished weekly, or as needed.

Hull Cell Test for Organic Contamination

The Hull Cell is used to check the condition of an electroplating solution. It replicates the plating bath on a laboratory scale and helps determine the effects of organic impurities. Hull Cells are available from a number of suppliers that can be found on the internet.

The following procedure is suggested for **Flo King** carbon treatment:

1. When organic contamination is suspected, stop production plating.
2. Plate Hull Cell test panels to determine the degree and effect of the suspected organic contamination.
3. Recirculate the production plating solution through the **Flo King** pump and carbon treatment device (Cartridge, Bag or Canister) for at least one hour, then plate more Hull Cell panels. Check the panels to see if there is any improvement.
4. If there is improvement in the Hull Cell panels but not to the degree desired, continue to carbon treat and plate additional Hull cell panels every hour until contaminants have been removed to an acceptable level. This can usually be accomplished in one to eight hours, though some users treat overnight or up to 24 hours.
5. When plating is restored to normal, remove the carbon treatment device and replace it with filter cartridges to remove dirt and other particulates.

Caution! Any carbon or carbon treatment device that has been saturated with organic impurities should be removed from solution. This will prevent the possible release of these contaminants back into solution.