



INSTRUCTIONS FOR USING FLO KING IN-TANK CARBON BAG

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 Bag!

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 tank contains large amount of solids, it may be necessary to DE-SLUDGE before carbon treatment. Let solution settle for 24 hours or until sediment has dropped to bottom of tank. Remove solution very carefully, without disturbing sediment on bottom of tank. Remove sludge, clean tank, and pump solution back into tank.

CAUTION! NEVER TILT PUMP WITH CARBON BAG INSTALLED. KEEP PUMP AND BAG IN UPRIGHT VERTICAL POSITION AT ALL TIMES. TILTING COULD RESULT IN BAG SNAPPING AT NECK, CAUSING CARBON PELLETS TO SPILL INTO TANK!

PRECAUTIONARY PROCEDURE TO AVOID INTRODUCING CARBON DUST INTO SOLUTION

Under normal circumstances, Flo King Carbon Bags will not introduce appreciable carbon dust into the solution being treated. However, rough shipping and handling or even reactions with certain chemical solutions could cause some carbon dust to be expelled when the bag 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 Bags.**

- 1.** Loosen three Filter Screws (thumbscrews) on Flo King pump until flush with inside wall of Impeller Housing to allow for easy insertion of Carbon Bag. Insert portion of filter cartridge protruding from Carbon Bag into housing, then secure by re-tightening Filter Screws.
- 2.** Immerse bag in tank or other vessel containing clean water for 15 minutes. Do not turn pump on. This step will saturate carbon pellets.
- 3.** After the 15-minute soak, turn pump on for 5 minutes. During this time, some carbon dust may be expelled into the water, and some will be captured in Carbon Bag inner filter cartridge. After 5 minutes, turn the pump off.
- 4. Optional But Recommended:** Immerse Carbon Bag in small vessel (for example, a 5-gallon bucket) of solution to be carbon treated for 5 minutes. Do not turn pump on. This will allow time for gassing that may occur when chemical solution first reacts with carbon. After 5 minutes, quickly turn pump on and off to expel trapped air. This may be repeated every 30 seconds until air is expelled and carbon dust is captured in Carbon Bag inner filter cartridge. A small amount of carbon dust may be visible but should not cause alarm. The Carbon Bag will normally filter a small amount of carbon dust from solution.



CAUTION: WEAR GLOVES, GOGGLES AND PROTECTIVE CLOTHING AND FOLLOW ALL PERTINENT SAFETY PROCEDURES TO PREVENT INJURY TO PERSONNEL AND DAMAGE TO THE ENVIRONMENT!

FLO KING CARBON BAG TREATMENT PROCEDURE

Do Not Begin Carbon Treatment Until You Have Read and Implemented "Precautionary Procedure to Reduce Carbon Dusting" (above)

1. Place pump, with Carbon Bag attached, in tank to be treated. Do not turn pump on. Leave bag submerged in solution for 5 minutes. This will allow time for gassing that may occur when solution first reacts with carbon.
2. Quickly turn pump on and off to expel trapped air. This may be repeated every 30 seconds until air is expelled and carbon dust is captured in Carbon Bag inner filter cartridge. A small amount of carbon dust may be visible but should not cause alarm. The Carbon Bag will normally filter a small amount of carbon dust from solution.
3. Turn pump on and begin carbon treatment.
4. If solution has not been adequately filtered with filter cartridges prior to treatment, a layer of sludge may form on outside of Carbon Bag. If this occurs, lift Carbon Bag out of bath and set in bucket, carefully following "REMOVAL" instructions below.
5. Spray off sludge with clean water and set unit back into tank. This procedure does not hinder effectiveness of carbon. The carbon will continue to adsorb organics until saturated. A pound of Flo King carbon pellets will adsorb about a pound of organics.
6. Test every hour or every few hours using a Hull Cell or other procedure to determine if solution is purified. Treatment times of as little as four hours and as many as 24 hours are typical. It is sometimes possible to use a bag more than once before replacement is necessary. However, never use the same Carbon Bag in more than one type of solution.

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REMOVAL OF CARBON BAG FROM SOLUTION

1. Turn pump off. Then lift pump out of solution until top of Carbon Bag is visible.
2. Grasp cord handle on Carbon Bag and lift pump and Carbon Bag out of solution. Place in container to drain. Loosen three Filter Screws (thumbscrews) that hold Carbon Bag onto pump. Remove pump from Carbon Bag.
3. There are two types of Carbon Bags—disposable and reusable. If you are using the disposable type, dispose of the carbon (or complete Carbon Bag) in accordance with applicable environmental regulations.
4. If you are using the Permacore Reusable Bag, refer to reassembly instructions on Pages 3, 4 and 5.



FLO KING PERMACORE REUSABLE CARBON BAG DISASSEMBLY AND CLEANING INSTRUCTIONS

Always wear proper protective gear such as gloves, aprons and goggles. Solution safety procedures must be followed to prevent injury to personnel or damage to the environment.

DISASSEMBLY & CLEANING INSTRUCTIONS

When shipped by the factory, the Permacore Reusable Carbon Bag is filled with carbon and ready to use. When the carbon is spent, you must disassemble and clean the bag, then refill with carbon and reassemble the bag. To disassemble and clean:

1. Remove carbon bag from Flo King pump by loosening Filter Screws (thumbscrews) on pump. Allow bag to drain in bucket.
2. Untie two knots on strings at top of bag. Use pointy implement if necessary to help untie knots.
3. Fully loosen string and then open top of bag.
4. Remove Carbon Retainer Ring (white ring) from top of bag.
5. Empty carbon from bag. Make sure to dispose of carbon in accordance with applicable environmental regulations.
6. Loosen nut at bottom of bag.
7. Remove filter cartridge from bag.
8. Slide plastic web off of filter cartridge.
9. Unroll filter blanket from cartridge core. Most users then lay blanket on piece of grating over suitable tank, drum, reservoir or wastewater treatment pit and spray each side using an ordinary hose and spray nozzle (or, if available, pressure spray washer). Normally, this is sufficient for cleaning; however, some contaminants may build up and not flush out completely. In many applications, these contaminants can be removed easily by placing Magnum filter blanket in an appropriate chemical solution.

CAUTION: Never mix cyanide-laden materials with acids; this combination produces hydrogen cyanide gas, which is lethal if inhaled! The process solution to which the Magnum blanket has been exposed must be compatible with the acid from a SAFETY and USE standpoint.



Clean blanket.



Re-roll blanket around core.



(L-r) Place plastic loading slats over filter. Then slide web over slats and pull down. Remove slats and cartridge is ready to reuse.



PERMACORE REUSABLE CARBON BAG REASSEMBLY INSTRUCTIONS (continued)

REFER TO PHOTOS ON PAGE 5

1. Insert filter cartridge into bag. Make sure to keep cartridge in center of bag.
2. Tighten nut at bottom of bag onto threaded end of filter cartridge (Fig. 1).
3. Fill bag with carbon until it reaches bottom of Permacore Head – about 1-1/2" (4 cm) from top of filter cartridge (Fig. 2). Caution: Do not overfill bag and do not allow carbon to get into center of filter cartridge!
4. Stretch Carbon Retainer Ring over Permacore Head (Fig. 3).
5. Lower Carbon Retainer Ring until it is positioned just above carbon on lower groove of Permacore Head (Figs. 4 and 5).
6. Cross strings on top of bag to prevent bag seams from pulling apart. Pull string on right side of Bag about 3" (8 cm) longer than string on left side of bag (Fig. 6). Wrap strings once around top of bag (Fig. 7).
7. Position bag so that vertical seam on bag is on your left. Loosely tie square knot as close as possible to vertical seam on bag (Fig. 7).
8. Slowly pull string tight while pushing square knot toward Permacore Head (Fig. 8). *Note: It is advisable to use gloves to pull string tight. An even better idea is to make an improvised tool as shown in Fig. 8, using 1/2"-diameter pipe with a couple of drilled holes. Thread bag strings through pipe holes to improve leverage, then use tool as a handle to help tighten bag strings.*
9. If necessary, use a pointy tool, like scissors, to lift and move material at top of bag closer to Permacore Head in order to fully close bag and prevent carbon from escaping (Fig. 9).
10. Pull strings until tight against top of bag. Then use a strong jerking motion to fully tighten knot.
11. Wrap strings around top of bag a second time, then tighten and tie another square knot for additional security.
12. Tie strings together to make a loop for use as a handle. The handle is helpful when lowering bag into solution for carbon treatment.



REASSEMBLING FLO KING PERMACORE REUSABLE CARBON BAG: STEP BY STEP



Fig. 1. Insert filter cartridge into bag and tighten nut at bottom.



Fig. 2. Fill with carbon to bottom of Permacore Head.



Fig. 3. Gently stretch Carbon Retainer Ring over Permacore Head.



Fig. 4. Lower Ring to bottom groove of Permacore Head.



Fig. 5. Carbon Bag should now look like this.



Fig. 6. Pull string on right side of bag about 3" longer than on left.



Fig. 7. Wrap strings around top of bag. Loosely tie square knot.



Fig. 8. Use gloved hand or tool to help tighten string.



Fig. 9. Use pointy tool to move bag material close to Head.



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) and carbon treatment attachment. 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.