



PURIFICATION OF ELECTROPLATING SOLUTIONS

GRANULAR vs POWDERED CARBON

FACT #1

Granular carbon can have more adsorptive surface area than powdered carbon.

Surface area of activated carbon is the internal pore surface area which is compared to a complex network of caverns and accomplishes the adsorptive phenomena. Surface area of SERFILCO 8 x 30 mesh carbon is 1,000 square meters per gram. Surface area of some powdered* carbon is 650 sq. meters per gram.

FACT #2

Granular carbon and powdered carbon have the same adsorptive potential.

Organic impurities in the solution can be removed with either granular or powdered carbon. A standard contaminant for measuring carbon adsorbency is carbon tetrachloride. **FILTERSPUN carbon adsorbs a maximum of .55 lbs. of carbon tetrachloride per 1.0 lb. of carbon. Powdered carbon adsorbs a maximum of .44 lbs. of carbon tetrachloride per 1.0 lb.

FACT #3

Powered carbon adsorbs faster than granular carbon.

The smaller the individual particle of carbon is, the faster the molecules that are to be adsorbed can find their way into this network. For equal contact time and equal weights, powdered carbon will, therefore, adsorb more impurities than granular carbon. However, with proper carbon and system design, a granular carbon purification chamber can adsorb impurities equal to that of powdered carbon.

FACT #4

Granular carbon purifies by an adsorption wave front.

A granular carbon adsorptive column will have a height-to-diameter ratio from 2 to 1 up to 6 to 1. With the impure liquid entering at the top of the column, there is a saturated zone and then an adsorptive zone. The length of this adsorptive zone is a function of the particular compound, the adsorptive system, pressure, flow, temperature, etc. Liquid exiting this adsorptive zone will move downward through the carbon column until it reaches the bottom. At this point the exiting solution could be impure, so the carbon should be replaced.

FACT #5

Granular carbon purification system are external to the filter system.

With the carbon installed on the filter discharge, only filtered solution contacts it. This arrangement permits the efficient use of the carbon as a purifier and prevents it from being used as a filter.

Control valves on the filter discharge offer the ability to adjust solution flow. Filtered solution can be discharged directly to the plating tank, proportionally through the carbon or totally through the carbon. Additionally, the carbon chamber can be serviced while the filter is in operation.

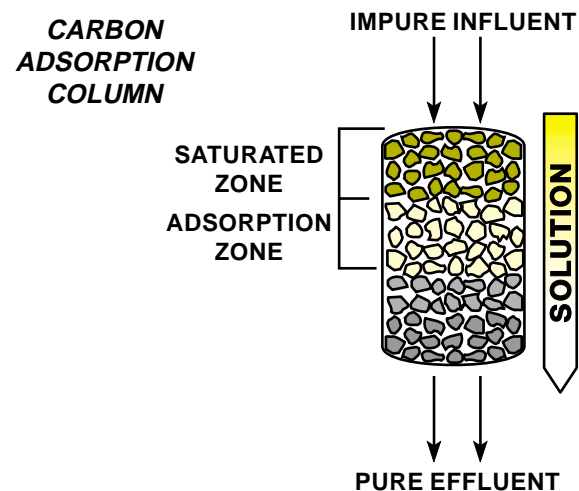
FACT #6

Granular carbon purification systems are simple to operate.

The purification rate can be controlled as conditions require. An adjustable low flow rate of 5% to 10% of the filter flow directed through the carbon permits the solution to be highly purified. Purification is accomplished by extended contact time. When solution organic load is removed, carbon can be valved off to extend carbon life and eliminate removal of brighteners, etc.

* Powdered carbon, commonly used for continuous and batch treatment of plating solutions. Surface area and adsorbency may vary between manufacturers.

** Testing performed with commercially available organic solvent for standardization. Adsorptive reaction with plating bath organics, impurities, additives, temperature, etc. cannot be predetermined or duplicated for test.



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FACT #7

SERFILCO granular carbon purification chambers have trap filters.

To prevent carbon granules from being carried into the plating tank, trap filter cartridges are provided at the discharge of the purification chamber. *Therefore, solution is filtered twice — once prior to contacting carbon, then upon exiting the carbon chamber.

FACT #8

Granular carbon purification chambers can be added to any existing filter system.

Adapter kits with 1 or 2 flow control valves, fittings, pipes and hose are available. Carbon chambers containing 1 to 1,000 lbs. of activated granular carbon for flow rates of 1 to 200 GPM are offered. Purification systems with separate pumps are also available where complete independence of the filter system is required.

* Some chambers are available with a screen instead of a trap filter.

FACT #9

Granular carbon systems can reduce pollution.

The avoidance of backwashing or disassembling and cleaning a powdered carbon precoat filter can significantly reduce solution loss and required waste treatment. Granular carbon systems have resulted in the significant reduction of batch treatment frequency and, in some cases, its total elimination.

FACT #10

SERFILCO granular carbon is manufactured to precise specifications.

It is processed for the purification of plating solutions, industrial process streams and waste water effluents. Pretreatment acid washing to remove extractables is not required. Because of its hardness, granular carbon requires minimum flushing time to remove fines generated by shipping and handling.

