



TECHNICAL BULLETIN

PURIFICATION OF ELECTROPLATING SOLUTIONS

GRANULAR VS POWERED CARBON

FACT NO. 1

GRANULAR CARBON HAS 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 Hi-Surf 12X30 mesh is 1050 sq. meters per gram. Surface area of commonly used powdered* carbon is 650 sq. meters per gram.

FACT NO. 2

GRANULAR CARBON AND POWDERED CARBON HAVE THE SAME ADSORPTIVE POTENTIAL.

Organic impurities in the solution can therefore be removed with either granular or powdered carbon. For example, a standard contaminant for measuring carbon adsorbency is Carbon Tetrachloride.** Serfilco Hi-Surf adsorbs a maximum of .55 lbs. of Carbon Tetrachloride per 1.0 lb. Powdered carbon adsorbs a maximum .44 lbs. of Carbon Tetrachloride per 1.0 lb.

FACT NO. 3

POWDERED CARBON ADSORBS FASTER THAN GRANULAR CARBON.

The smaller the individual particle of carbon is, then the faster 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 more impurities than an equal weight of powdered carbon.

FACT NO. 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 saturation 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 be free of impurities. As saturation occurs, the adsorptive zone will move downward through the carbon column until it reaches the bottom at which point the exiting solution is then impure.

FACT NO. 5

GRANULAR CARBON PURIFICATION SYSTEMS ARE EXTERNAL OF THE FILTER SYSTEM.

Installed on the filter discharge, only filtered solution contacts the carbon. This permits efficient use of the carbon as a purifier since it is not used as a filter. The adjustable low flow rate permits the effluent to be highly purified. With 5% to 10% of the filter flow rate directed through the carbon, purification is accomplished by extended contact time.

* 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.

(OVER)

FACT NO. 6

GRANULAR CARBON PURIFICATION SYSTEMS ARE SIMPLE TO OPERATE.

Control valves on filter discharge offer complete flexibility and adjustment of flow through filter and carbon. Carbon chamber may be serviced while filter is in operation, and purification rate can be controlled as conditions require. Filtered solution can be discharged directly to the plating tank, proportional through the carbon or total flow through the carbon.

FACT NO. 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. Purified solution is therefore filtered twice, prior to contacting carbon and also upon exiting the carbon chamber.

FACT NO. 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 only are necessary. Carbon chambers containing 1 to 1000 lbs. of activated granular carbon for flow rates of 1 to 200 GPM are available. Purification systems with separate pumps are also available where complete independence of filter system is required.

FACT NO. 9

GRANULAR CARBON SYSTEMS CAN REDUCE POLLUTION.

The avoidance of backwashing or disassembling and cleaning a powdered carbon precoat filter can significantly reduce solution lost 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 NO. 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 required to remove fines generated by shipping and handling.

