



## FILTRATION OF WATER

### WHY PRE-FILTRATION IS IMPORTANT

"Clean" water is an essential raw material for any plating or anodizing process.

Water from natural sources such as a well, lake, etc., probably needs softening for calcium removal or carbon treatment for the reduction of organic impurities. Certain applications require that the water be essentially free from all ions. This can be accomplished with ion exchange.

Softening, carbon purification or ion exchange equipment are not basically filters in themselves, although they sometimes function as such. Each will operate to its maximum efficiency only if the water is first filtered, usually with 15 micron media, to be free of solids. Otherwise, solids will coat over the resin in a softener or ion exchange bed or over the carbon in a purification unit, preventing efficient adsorption. Trap filters of 1 or 3 micron density are recommended following these units to prevent migration of the resin or carbon media.

The quality of water required will vary, depending upon its ultimate use, such as for makeup of an electroplating solution or for rinsing. Solids entering the plating tank with the makeup water may amount to only 5% of the total to be filtered. They should be removed at the source, since it is easier to service a water filter than a plating filter. It is also easier to replace the filter media in the prefilter to a deionizer than it is to regenerate and wash the resin bed.

Filtration is especially important in the reverse osmosis process, since solids will plug the pores in the membrane and decrease its efficiency.

### CONSERVE WATER . . . SAVE MONEY

Since the cost of water is continually rising, its efficient use is of increasing importance. The efficient use of water is also necessary in order to conserve our limited water resources. Considerable reduction in rinse water volume can be achieved with multiple counter-current flow rinse tanks, spray rinsing of parts and longer draining time of plating barrels. A conductivity meter can monitor and automatically control the dissolved solids concentration in a rinse tank by means of a signal to a solenoid valve on the water inlet. The reuse of water is also feasible with ion exchange or reverse osmosis treatment, which removes contaminants. In order to operate efficiently, these processes require filtered water free of solids.

### SIMPLE TO ACCOMPLISH

Filtration of either inline water supplies or recirculatory systems may be accomplished with depth type cotton cartridges providing particle retention from 100 down to 1 micron, or disposable cartridges of the surface type which are offered in absolute ratings of .25 to 1 micron. Precoat filters which can be manually cleaned or backwashed are also suitable for this purpose. The choice of filter is usually dependent upon the amount of solids, the particle retention desired, available space and initial investment considerations.

Filter chambers from 1 to 445 cartridges in size are avail-

able in both non-metallic and metallic construction. Pressure requirements will vary from 30 to 60 psi for inline applications, or where pumps are used for recirculation of water from tanks.

SERFILCO manufactures all plastic (non-metallic solution contact) pumps which provide adequate pressure to achieve the flow through the filter on an economical basis before servicing of the filter is required. Generally, 1 cartridge per 5 GPM flow is adequate; however, for most well water, 1 cartridge per 2 or 3 GPM flow is recommended.

### IMPROVE QUALITY — PREVENT PARTS REJECTS

Filtration can prevent spotting of parts when deionized water is used for final rinsing after anodizing or plating. Filtration also prevents spray nozzles from plugging up and causing a distorted spray. Even water used for flushing pump seals should be filtered to prevent gritty particles from causing premature packing or seal failure and leakage of the solution being pumped. Other frequent applications for filtration include water used in cooling towers or in paint spray boots. All water used in industrial processes should be filtered to prevent clogging, which can disrupt operation of the entire system.

## FILTRATION OF CLEANERS AND ACIDS

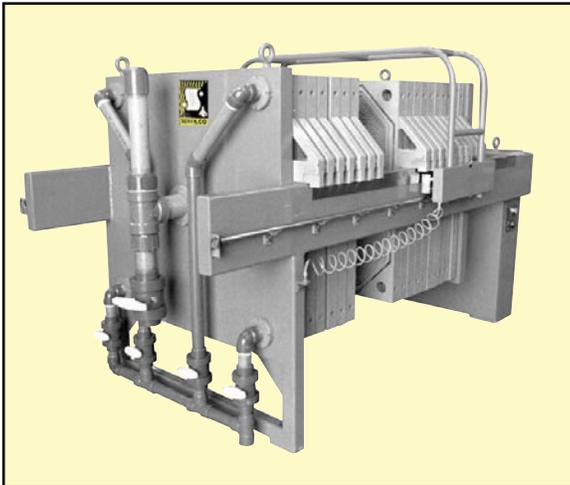
Alkaline soak and electro-cleaners are formulated to remove dirt and soil of all kinds from metal surfaces. They accumulate considerable amounts of solids and organic contaminants. With a heavy dirt load, continuous or periodic filtration with coarse (50+ micron) cartridges is recommended; but, removal of floating scum by skimming is definitely necessary in order to avoid the redeposition of the soil on the parts when they are lifted out of the cleaning tank. It is most important to remove all oil floating on the surface. For this purpose, a skimming device and a coalescer can be used to separate the oil from the cleaner. Non-emulsifying cleaners are increasingly being used to facilitate the separation process. Periodic carbon treatment may also be necessary.

The use of a SER-DUCTOR® air-free agitation system on the cleaner tank will keep dirt particles in suspension, enhancing the ability of the tank's filter system to remove them before they can precipitate to the tank bottom and form a layer of sludge. With continuous filtration, reliance on sedimentation of sludge over a weekend followed by the decanting of the cleaner to reduce this layer of insoluble dirt in the tank is eliminated, along with the highs and lows in solution clarity and the labor and downtime required for the decanting operation. Grease, oil and smut deposits from machining, stamping, drawing and quenching operations can be reduced by filtering the coolants and oils used in the processes. Most waxes and buffing compounds are removed by good soak cleaning. Depending on the work load, some tank cleaners can be used from several months to a year, provided the solutions are periodically analyzed and replenished.

### FILTRATION CUTS COSTS

Most acid etches and pickles are generally not filtered, the insoluble matter is allowed to settle. However, with filtration, the life of acid solutions can be greatly prolonged. Appreciable reduction, not only in chemical costs, but also in the waste treatment required when acid dumping, is affected.

# FILTRATION OF PLATING AND OTHER INDUSTRIAL WASTE



## SLUDGE DEWATERING

The most common device used to dewater concentrated sludge is the ***Recessed Plate Filter Press***. All non-metallic solution contact is preferred. Center feed with four corner discharge and blow-down manifold is a basic configuration. Small units of a few cubic feet capacity are available with an air operated hydraulic pump system. Larger units incorporate a semi-automatic hydraulic opening and closing system along with a semi-automatic plate shifter. Sludge volume reductions of over 95% can be achieved.

## FINAL EFFLUENT CLARIFICATION

Many waste treatment systems designed in the past do not meet today's standards. Because of increased loading or stricter requirements, a final polishing filter may be required on the clarifier discharge. The ***TITAN Automatic Backwash Filter System*** is a series of automatic backwash filtration systems employing permanent filter media of a specific size / density in a filter bed through which contaminated solution is fed at controlled limits of flow and pressure. Computer control automatically maintains constant design flow without compacting particulate onto the media bed. The backwash cycle, programmed for optimum use of backwash fluid, responds automatically to a preset minimum flow rate of filter discharge.



## FILTRATION OF CLEANERS AND ACIDS

A ***Filtration System*** consisting of a pump and chamber containing filter cartridges will remove particulate matter from aqueous and acid solutions. An optional carbon chamber can be added to remove organic contaminants.

A ***SER-DUCTOR*** air-free agitation system installed on the solution reservoir will keep particles suspended, thereby enhancing the ability of the filter system to remove them.

Solutions from cleaning operations including parts washers and water wall spray booths as well as from cooling towers, water polishing and coolants for deburring and grinding operations all can be clarified with an ***Automatic Disposable Fabric Filter***.



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