

CLEANING FOR ELECTROPOLISHING

■ TO AVOID:

- PITTING
- SURFACE ETCHING
- NON-UNIFORM FINISH
- CARBON RESIDUES IN AES PROFILES

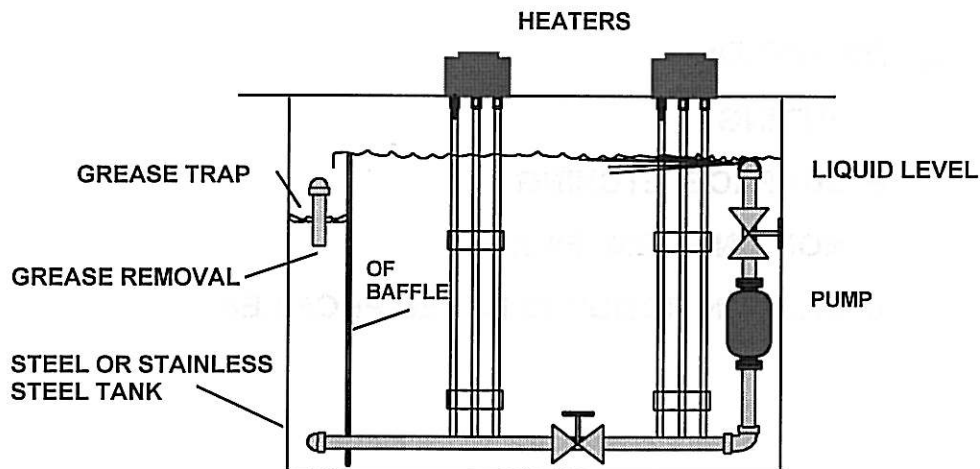
DEFECTS CAUSED BY INADEQUATE CLEANING

Soils films left on the surface of the stainless steel substrate act as insulators and prevent a uniform flow of current. In those areas where the flow of current is retarded or reduced by the film, low current density effects may be apparent.

Typical low current density effects include a "frosted", etched, or pitted appearance. Such defects are usually unacceptable for high quality electropolishing. Non-uniform finishes may also be objectionable for cosmetic work.

A number of recent literature studies have noted the occurrence of a significant amount of carbon in the AES surface profile. The carbon is generally attributed to lubricant films left on the surface prior to electropolishing. Although several high-tech methods, including gas plasma cleaning, have been proposed, most of the problem could also be eliminated by standard, inexpensive alkaline cleaning.

Recirculating Skimmer System



RECIRCULATING SKIMMER SYSTEM

The alkaline soak cleaner tank can be equipped with a recirculating skimmer to improve cleaning and to extend the useful life of the solution.

The system illustrated above uses a vertical overflow baffle to divide the tank into two chambers, a larger one which serves as the main cleaning chamber and, a smaller one, which serves as a grease trap. Solution is pumped from the smaller chamber and is sprayed through a perforated pipe located just below the surface of the cleaning chamber. All floating soils, including greases, oils, and waxy residues are flushed over the top of the skimmer baffle and collect on the surface of the small chamber. Periodically, a valve located near the top of the grease trap is used to drain off the accumulated oily materials for disposal.

The pumps used are generally cast iron construction with a magnetic impeller. Care must be taken to prevent accumulation of magnetic particles, such as metal chips, on the impeller. A "Y" strainer (not shown in the diagram above) is normally installed to trap metal particles and to prevent damage to the impeller.

Magnetically driven pumps are available in models with a variable speed control. Normally, the pumping rate required is fairly low, and can be adjusted to the lowest speed capable of providing a continuous flow of solution over the baffle. The pump is normally installed between two ball valves which can be shut off for maintenance or replacement operations on the pump.

A recirculating skimmer tank maintains the liquid level in the cleaning chamber, but the level in the skimmer chamber continually drops as the heated solution evaporates. The tank should be plumbed for periodic addition of fresh water to replace the evaporation and to prevent damage to the pump or the heaters. It should be noted that properly selected alkaline cleaners do not evaporate significantly with the water vapor, and can be quickly reconstituted with the addition of water.