



# SERFILCO® CASE HISTORY

## SERFILCO TITAN

### Permanent media filtration system improves plating quality and reduces costs for Danish wire products manufacturer.

When NKT Wire Works of Middelfart, Denmark, purchased its second automatic barrel plating line from CIE of Italy, it didn't expect its results to look like gold, or even brass. However, with a solution that was filtered as clear as apple juice, its fasteners took on that appearance.

Actually, the solution was acid zinc-iron alloy in a 2,100 U.S. gal. (8000 litre) tank with eleven barrel stations used to plate wood screws and automatic and single set nails. The company also uses other plating solutions to produce wire mesh and screens used in the separator stage of mining operations.

But, let's return to their first automatic plating machine equipped with a movable belt type paper filter. The filter had a pressurized area that clamped a small portion of paper media which retained the iron quite nicely, but as the media loaded, the flow was reduced. The paper was manually indexed on a daily basis to be clamped into a new pressurized platen bed. Thus, the flow was never at its maximum point to achieve good solids removal and the solution was always brown and murky, creating a dull deposit.

When a second automatic plating machine was being considered, their chemical supplier, Ytema, of Sweden brought to their attention an automatic multi-media filter that they had seen in operation in the United Kingdom. The filter removed iron continuously from an acid zinc solution without manual attention. It featured a computerized control panel which sensed both pump pressure and flow rate to actuate a backwashing procedure which operated unattended.

NKT liked the concept of a separate filter, independent of the plating machine and ordered a system known as the TITAN, manufactured by SERFILCO, Ltd. of Northbrook, Illinois. It was installed in January, 1998.

To this day, the system has been operated with daily backwashing and without filter media replacement or disposal cost.

The acid zinc solution is not murky as was the case in the first automatic machine, but impressively clear, which acknowledges the fact that not just some, but actually all the precipitated iron was being removed almost as fast as it was being generated. Moreover, the multi-media in the filter, with daily backwashing, was always clean so it could maintain optimum filtration.

The significant difference between the two methods of filtration was in the achieved high flow rate due to the automatic backwashing cycle of the TITAN, during which

time the media is first purged with air to send the plating solution back to the plating tank; then with automatic valving, water from a clean source is directed into the filter discharge port. The force and velocity of the water into the filter media dislodges the accumulated iron particles, sending them out of the filter chamber into a collecting tank for metering into the company's waste treatment system. The iron particles are then disposed of along with other neutralized hydroxide solids.

It was thought that an occasional leaching with a solution of hydrochloric acid might be necessary, but after several years of continuous operation, the filter media is still free of any residual iron and performing at its designed flow rate.

The filter system is designed for two turnovers per hour, which means the *total* volume of liquid in the plating tank passes through the filter at least twice each hour. Of further benefit to NKT is the possibility of operating 24 hours a day,



Ib-René Therkildsen, Sectional Engineer - Screw Sector at NKT views the automatically controlled SERFILCO TITAN permanent media filtration system.

seven days a week. The totally automatic TITAN system requires no labor so there is no time lost for shutdown and maintenance.

The pump on the system, driven by a 3 HP motor, features an enclosed high efficiency impeller capable of discharge pressures up to 45 psi. The pump seal is water lubricated to prevent abrasive wear or the introduction of air, so a long seal life can be expected.

The plating achieved in this automatic line is of consistently high quality and uniform in coverage (averaging 5 micron). The color is bright and, most importantly, customers are provided with product which meets their most stringent requirements.

Were it not for the consistently reliable filtration provided by the TITAN system to NKT's high volume of 17,600 lbs. (8000 Kg.) of wire goods being packaged daily for customers, the cost of rejects (labor, storage, handling and rework) would reach unacceptable levels.

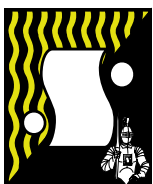
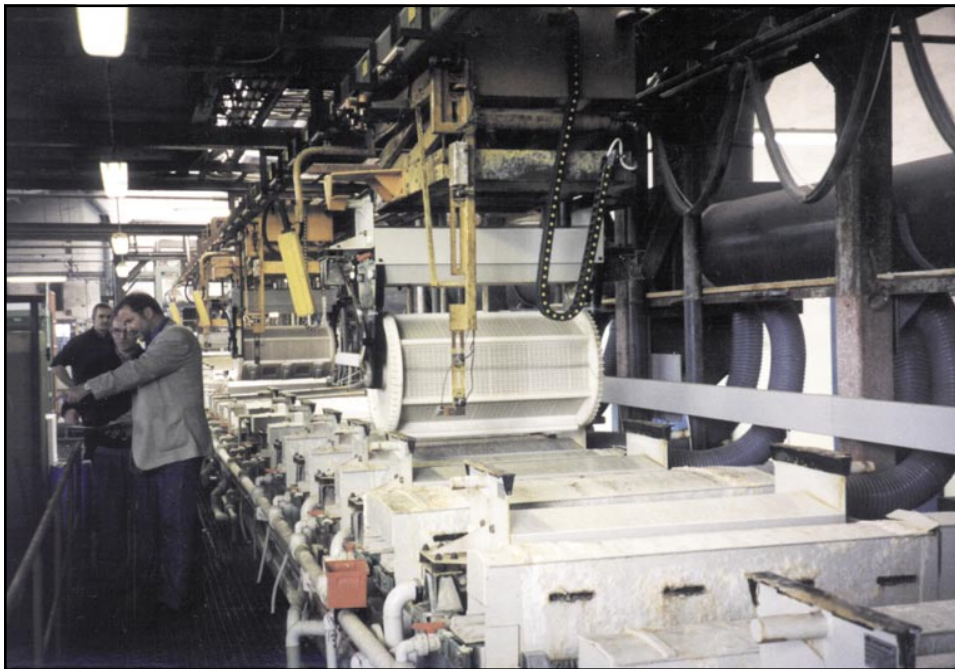
Perhaps the most telling fact about this application is the low profile the filtration system has maintained from its installation and especially during the tenure of the new plant manager. It has developed no maintenance troubles and no consumable costs, items that normally attract the attention of anyone responsible for plant operations. NKT's experience proves the TITAN system truly provides unattended, completely automatic filtration.



Above: Some of the daily output of wood screws and automatic and single set nails from NKT's automatic plating lines.



Below: NKT's new 11 barrel station, automatic plating line. The acid zinc solution is kept clear of precipitated iron by the SERFILCO TITAN permanent media filtration system.



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