



# SERFILCO® CASE HISTORY

## PLATING

### *Permanent media filter proves itself in a competitive environment in Japan*

by Shoichi Suzuki - Sanmei Kasei Co., Ltd.  
and Clem Traut - SERFILCO, Ltd.

Toyohashi Plating Co., Ltd. of Toyohashi City, Japan, is a job shop plater for the automotive industry. It is a progressive company, always open to new ideas and innovations. Since the company plates in the automotive industry which is very competitive, it is essential to maintain the highest quality and the lowest cost possible, especially for customers such as Toyota, Honda and Minolta.

Toyohashi Plating Co. has three automatic barrel plating lines, three automatic rack plating lines and various manual lines for plating on ceramics and other materials. They have 50 employees plating various processes such as acid zinc, tin, copper, tin-lead, nickel and tin-zinc. Because of the high iron contamination in the acid zinc plating solution, it became increasingly obvious that their existing semi-automatic backwash precoat filter system was too labor intensive to operate, and use of filter aid created excessive sludge. This caused production downtime and too much labor to service the filter. Also, as a result of the use of filter aid, the environment in the plating shop became dirty and increased costs for waste water treatment and chemicals were incurred.

After considering many alternative filtration systems, including cartridge and disc models, Mr. Mikiharu Takagi, Technical Director and son of the company's president, Mr. Seiji Takagi, recommended the SERFILCO TITAN-90 permanent media filtration system with automatic backwashing capability.

The younger Mr. Takagi had previously travelled to the United States as a member of the 1996 SUR/FIN Study Tour which had been coordinated by Mr. Shoichi Suzuki of Sanmei Kasei Co., Ltd. of Tokyo, Japan. During the tour they visited several plating shops where he was able to study TITAN-90 systems in operation. The understanding of TITAN-90 performance he gained from these visits gave him the confidence to recommend the system for Toyohashi Plating.

The unit, Model T-90-P60A, is rated at 13,600 LPH (3,600 GPH). It was installed on a 10,000 liter (2,642 gallon) eight barrel acid zinc chloride plating tank. Goals for the installation of the TITAN-90 system were:

1. To reduce labor requirements by eliminating the time consuming tasks of precoating and servicing the existing filter.
2. To eliminate solution loss which occurs when servicing the existing filter.
3. To decrease the generation of sludge for disposal by eliminating the use of filter aid.
4. To assure consistently high quality work and prevent high to low quality cycles resulting from variations in filter rate.
5. To extend the interval between hydrogen peroxide treatments of the plating bath, thereby reducing downtime and the need to pump out and transfer solution back to the plating tank.



**TITAN-90  
designed and  
manufactured  
with pride in  
the U.S.A.**

**TOYOHASHI PLATING CO., LTD.**  
**Operating log for TITAN-90 MODEL T-90-P60A**  
**Period: Jan 6 — May 20, 1997**

| DATE  | FLOW RATE - GPM |       |              |         | WORKING HOURS |       | % Δ FLOW ** | REMOVAL OF Fe with H <sub>2</sub> O <sub>2</sub> | BACKWASH |
|-------|-----------------|-------|--------------|---------|---------------|-------|-------------|--|----------|
|       | INITIAL         | FINAL | DIFFERENCE * | AVERAGE | DAILY         | TOTAL |             |  |          |
| 01/06 | 68              | 66    | 2            | 67.0    | 8.0           | 8.0   | 0.37        |  |          |
| 01/07 | 66              | 65    | 1            | 65.5    | 8.0           | 16.0  | 0.19        |  |          |
| 01/08 | 65              | 64    | 1            | 64.5    | 8.0           | 24.0  | 0.19        | ●  |          |
| 01/09 | 64              | 70    | 6            | 67.0    | 8.0           | 32.0  | +1.17       |  | ●        |
| 01/10 | 70              | 69    | 1            | 69.5    | 8.0           | 40.0  | 0.18        |  |          |
| 01/11 | 69              | 69    | 0            | 69.0    | 4.0           | 44.0  | 0.00        |  |          |
| 01/13 | 69              | 69    | 0            | 69.0    | 8.0           | 52.0  | 0.00        |  |          |
| 01/14 | 69              | 69    | 0            | 69.0    | 8.0           | 60.0  | 0.00        |  |          |
| 01/15 | 69              | 69    | 0            | 69.0    | 8.0           | 68.0  | 0.00        |  |          |
| 01/16 | 69              | 68    | 1            | 68.5    | 8.0           | 76.0  | 0.18        |  |          |
| 01/17 | 68              | 67    | 1            | 67.5    | 8.0           | 84.0  | 0.18        |  |          |
| 01/18 | 67              | 66    | 1            | 66.5    | 4.0           | 88.0  | 0.37        |  |          |
| 01/20 | 66              | 59    | 7            | 62.5    | 8.0           | 96.0  | 1.33        |  |          |
| 01/21 | 65              | 55    | 10           | 60.0    | 8.0           | 104.0 | 1.92        |  |          |
| 01/22 | 65              | 51    | 14           | 58.0    | 8.0           | 112.0 | 2.69        |  |          |
| 01/23 | 62              | 53    | 9            | 57.5    | 8.0           | 120.0 | 1.81        |  |          |
| 01/24 | 61              | 39    | 22           | 50.0    | 8.0           | 128.0 | 4.51        |  |          |
| 01/25 | 62              | 43    | 19           | 52.5    | 4.0           | 132.0 | 7.66        |  |          |
| 01/27 | 55              | 70    | 15           | 62.5    | 8.0           | 140.0 | +3.41       |  | ●        |
| 01/28 | 69              | 70    | 1            | 69.5    | 8.0           | 148.0 | +0.18       |  |          |
| 01/29 | 70              | 70    | 0            | 70.0    | 8.0           | 156.0 | 0.00        |  |          |
| 01/30 | 70              | 70    | 0            | 70.0    | 8.0           | 164.0 | 0.00        |  |          |
| 01/31 | 70              | 68    | 2            | 69.0    | 8.0           | 172.0 | 0.36        |  |          |
| 02/01 | 68              | 68    | 0            | 68.0    | 4.0           | 176.0 | 0.00        |  |          |
| 02/03 | 68              | 67    | 1            | 67.5    | 8.0           | 184.0 | 0.18        |  |          |
| 02/04 | 67              | 62    | 5            | 64.5    | 8.0           | 192.0 | 0.93        |  |          |
| 02/05 | 67              | 62    | 5            | 64.5    | 8.0           | 200.0 | 0.93        |  |          |
| 02/06 | 67              | 52    | 15           | 59.5    | 8.0           | 208.0 | 2.80        |  |          |
| 02/07 | 66              | 48    | 18           | 57.0    | 8.0           | 216.0 | 3.41        |  |          |
| 02/10 | 65              | 40    | 25           | 52.5    | 8.0           | 224.0 | 4.81        |  |          |
| 02/11 | 65              | 40    | 25           | 52.5    | 8.0           | 232.0 | 4.81        |  |          |
| 02/12 | 62              | 36    | 26           | 49.0    | 8.0           | 240.0 | 5.24        |  |          |
| 02/13 | 60              | 67    | 7            | 63.5    | 8.0           | 248.0 | +1.46       |  | ●        |
| 02/14 | 70              | 70    | 0            | 70.0    | 8.0           | 256.0 | 0.00        |  |          |
| 02/15 | 70              | 70    | 0            | 70.0    | 4.0           | 260.0 | 0.00        |  |          |
| 02/17 | 69              | 70    | 1            | 69.5    | 8.0           | 268.0 | +0.18       |  |          |
| 02/18 | 70              | 70    | 0            | 70.0    | 8.5           | 276.5 | 0.00        |  |          |
| 02/19 | 70              | 69    | 1            | 69.5    | 9.5           | 286.0 | 0.15        |  |          |
| 02/20 | 69              | 65    | 4            | 67.0    | 9.0           | 295.0 | 0.64        |  |          |
| 02/21 | 66              | 65    | 1            | 65.5    | 8.5           | 303.5 | 0.18        |  |          |
| 02/22 | 58              | 48    | 10           | 53.0    | 4.0           | 307.5 | 4.31        |  |          |
| 02/24 | 60              | 46    | 14           | 53.0    | 8.0           | 315.5 | 2.92        |  |          |
| 02/25 | 62              | 35    | 27           | 48.5    | 8.0           | 323.5 | 5.44        |  |          |
| 02/26 | 65              | 24    | 41           | 44.5    | 8.0           | 331.5 | 7.88        |  |          |
| 02/27 | 70              | 70    | 0            | 70.0    | 8.0           | 339.5 | 0.00        |  | ●        |
| 02/28 | 70              | 70    | 0            | 70.0    | 8.0           | 347.5 | 0.00        |  |          |
| 03/01 | 70              | 70    | 0            | 70.0    | 4.0           | 351.5 | 0.00        |  |          |
| 03/03 | 70              | 70    | 0            | 70.0    | 8.0           | 359.5 | 0.00        |  |          |
| 03/04 | 70              | 70    | 0            | 70.0    | 8.0           | 367.5 | 0.00        |  |          |
| 03/05 | 70              | 70    | 0            | 70.0    | 8.0           | 375.5 | 0.00        |  |          |
| 03/06 | 70              | 70    | 0            | 70.0    | 8.0           | 383.5 | 0.00        |  |          |
| 03/07 | 68              | 68    | 0            | 68.0    | 8.0           | 391.5 | 0.00        |  |          |
| 03/08 | 68              | 64    | 4            | 66.0    | 4.0           | 395.5 | 1.47        |  |          |
| 03/10 | 68              | 60    | 8            | 64.0    | 9.5           | 405.0 | 1.24        |  |          |
| 03/11 | 65              | 50    | 15           | 57.5    | 9.5           | 414.5 | 2.43        |  |          |

\* Difference = initial flow rate minus final flow rate.

\*\* % change in flow = flow rate difference ÷ daily working hours ÷ initial flow rate x 100. All changes are decreases in flow except where noted.

| DATE  | FLOW RATE - GPM |       |              |         | WORKING HOURS |       | % Δ FLOW ** | REMOVAL OF Fe with H <sub>2</sub> O <sub>2</sub> | BACKWASH |
|-------|-----------------|-------|--------------|---------|---------------|-------|-------------|--|----------|
|       | INITIAL         | FINAL | DIFFERENCE * | AVERAGE | DAILY         | TOTAL |             |  |          |
| 03/12 | 65              | 44    | 21           | 54.5    | 9.5           | 424.0 | 3.40        |  |          |
| 03/13 | 63              | 35    | 28           | 49.0    | 9.5           | 433.5 | 4.68        |  |          |
| 03/14 | 60              | 35    | 25           | 47.5    | 8.0           | 441.5 | 5.21        |  |          |
| 03/15 | 62              | 28    | 34           | 45.0    | 8.0           | 449.5 | 6.85        |  |          |
| 03/17 | 65              | 45    | 20           | 55.0    | 8.0           | 457.5 | 3.85        |  |          |
| 03/18 | 62              | 22    | 40           | 42.0    | 9.0           | 466.5 | 7.17        |  |          |
| 03/19 | 48              | 68    | 20           | 58.0    | 9.5           | 476.0 | +4.39       |  | ●        |
| 03/20 | 68              | 72    | 4            | 70.0    | 9.0           | 485.0 | +0.65       |  |          |
| 03/21 | 70              | 70    | 0            | 70.0    | 8.0           | 493.0 | 0.00        |  |          |
| 03/22 | 70              | 70    | 0            | 70.0    | 8.0           | 501.0 | 0.00        |  |          |
| 03/24 | 70              | 67    | 3            | 68.5    | 8.0           | 509.0 | 0.54        |  |          |
| 03/25 | 68              | 60    | 8            | 64.0    | 8.0           | 517.0 | 1.47        |  |          |
| 03/26 | 63              | 48    | 15           | 55.5    | 9.0           | 526.0 | 2.65        |  |          |
| 03/27 | 65              | 36    | 29           | 50.5    | 8.0           | 534.0 | 5.58        |  |          |
| 03/28 | 65              | 35    | 30           | 50.0    | 8.0           | 542.0 | 5.77        |  |          |
| 03/29 | 62              | 40    | 22           | 51.0    | 4.0           | 546.0 | 8.87        |  |          |
| 03/31 | 66              | 44    | 22           | 55.0    | 8.0           | 554.0 | 4.17        |  |          |
| 04/01 | 62              | 24    | 38           | 43.0    | 8.0           | 562.0 | 7.66        |  |          |
| 04/02 | 58              | 70    | 12           | 64.0    | 8.0           | 570.0 | +2.59       |  | ●        |
| 04/03 | 70              | 72    | 2            | 71.0    | 8.0           | 578.0 | +0.36       |  |          |
| 04/04 | 72              | 71    | 1            | 71.5    | 8.0           | 586.0 | 0.17        |  |          |
| 04/05 | 70              | 70    | 0            | 70.0    | 8.0           | 594.0 | 0.00        |  |          |
| 04/07 | 72              | 70    | 2            | 71.0    | 8.0           | 602.0 | 0.35        |  |          |
| 04/08 | 70              | 67    | 3            | 68.5    | 8.0           | 610.0 | 0.54        |  |          |
| 04/09 | 68              | 62    | 6            | 65.0    | 8.0           | 618.0 | 1.10        |  |          |
| 04/10 | 68              | 56    | 12           | 62.0    | 8.0           | 626.0 | 2.21        |  |          |
| 04/11 | 68              | 50    | 18           | 59.0    | 8.0           | 634.0 | 3.31        |  |          |
| 04/12 | 68              | 52    | 16           | 60.0    | 4.0           | 638.0 | 5.88        |  |          |
| 04/14 | 68              | 52    | 16           | 60.0    | 8.5           | 646.5 | 2.77        |  |          |
| 04/15 | 68              | 40    | 28           | 54.0    | 9.0           | 655.5 | 4.58        |  |          |
| 04/16 | 64              | 70    | 6            | 67.0    | 9.5           | 665.0 | +0.99       |  | ●        |
| 04/17 | 70              | 72    | 2            | 71.0    | 9.5           | 674.5 | +0.30       |  |          |
| 04/18 | 72              | 72    | 0            | 72.0    | 8.0           | 682.5 | 0.00        |  |          |
| 04/19 | 70              | 70    | 0            | 70.0    | 4.0           | 686.5 | 0.00        |  |          |
| 04/21 | 70              | 70    | 0            | 70.0    | 8.0           | 694.5 | 0.00        |  |          |
| 04/22 | 70              | 62    | 8            | 66.0    | 9.0           | 703.5 | 1.27        |  |          |
| 04/23 | 68              | 55    | 13           | 61.5    | 8.0           | 711.5 | 2.39        |  |          |
| 04/24 | 62              | 46    | 16           | 54.0    | 9.0           | 720.5 | 2.87        |  |          |
| 04/25 | 66              | 42    | 24           | 54.0    | 9.0           | 729.5 | 4.04        |  |          |
| 04/26 | 65              | 36    | 29           | 50.5    | 8.0           | 737.5 | 5.58        |  |          |
| 05/06 | 68              | 48    | 20           | 58.0    | 8.0           | 745.5 | 3.68        |  |          |
| 05/07 | 62              | 27    | 35           | 44.5    | 8.0           | 753.5 | 7.06        |  |          |
| 05/08 | 50              | 72    | 22           | 61.0    | 8.0           | 761.5 | +5.50       |  | ●        |
| 05/09 | 72              | 72    | 0            | 72.0    | 8.0           | 769.5 | 0.00        |  |          |
| 05/10 | 72              | 71    | 1            | 71.5    | 4.0           | 773.5 | 0.35        |  |          |
| 05/12 | 72              | 70    | 2            | 71.0    | 9.5           | 783.0 | 0.29        |  |          |
| 05/13 | 70              | 65    | 5            | 67.5    | 9.0           | 792.0 | 0.79        |  |          |
| 05/14 | 68              | 58    | 10           | 63.0    | 8.0           | 800.0 | 1.84        |  |          |
| 05/15 | 68              | 53    | 15           | 60.5    | 8.0           | 808.0 | 2.76        | ●  |          |
| 05/16 | 63              | 66    | 3            | 64.5    | 6.0           | 814.0 | +0.79       |  |          |
| 05/19 | 66              | 40    | 26           | 53.0    | 8.5           | 822.5 | 4.63        |  |          |
| 05/20 | 70              | 70    | 0            | 70.0    | 9.5           | 832.0 | 0.00        |  | ●        |

\* Difference = initial flow rate minus final flow rate.

\*\* % change in flow = flow rate difference ÷ daily working hours ÷ initial flow rate x 100. All changes are decreases in flow except where noted.

(continued from Page 1)

Operation of the TITAN-90 is completely automatic and in spite of the high dirt load, the system consistently maintains a high average flow rate of 90-95% of the initial flow. When the flow rate is reduced by compacted media, the automatic backwash takes over and the unit is returned to full flow in a matter of minutes. (See chart on previous pages.)

The installation has been a complete success. From January, 1997, when the TITAN-90 system was installed, until mid-May, there was no need to hydrogen peroxide treat the plating bath. Normally, this procedure is necessary on occasion to remove impurities from the bath and to prevent rejects. Although Toyohashi Plating Company personnel don't know why the TITAN-90 has reduced the frequency of hydrogen peroxide treatment, they are very satisfied with the performance of the unit and are quite pleased with the added benefit. It has resulted in a savings in labor and a reduction in down-time.

The log of the operation of the TITAN-90 system clearly shows the continual high flow rate maintained by the filter which contributes to the consistent cleanliness of the plating bath. After five months and 800 hours of operation, the TITAN-90

filter operated at rated capacity, with no consumption of the permanent media. The TITAN-90 has maintained the plating bath at a cleaner level than the previous filter and the plant environment is also cleaner since it is no longer necessary to handle filter aid on a daily basis.

The scrupulously recorded operating log of the TITAN-90 system does not tell the whole story of the unit's cost effectiveness. Not shown in the log entries are such savings as labor costs for precoat and maintenance servicing of the old filter system, plating chemical costs for make-up of solution lost during servicing of the old filter system, lost production due to down-time for hydrogen peroxide treatment, and the disposal costs for filter aid generated sludge. Perhaps the most significant advantage derived from the TITAN-90 system is the knowledge that the equipment maintains the clarity of the bath so that high quality plated work is being produced on a consistent basis.

Mr. Takagi is very proud of the quality record of Toyohashi Plating and with the help of the TITAN-90 filtration system, he intends to maintain the high quality standards the company has set for itself.

### How do your costs compare?

| RUNNING COST COMPARISON PER MONTH —<br>PRECOAT FILTER vs. TITAN-90 |                                 |   |
|--|---------------------------------|---|
|  | TITAN-90 PERMANENT MEDIA FILTER | YOUR EXISTING DIATOMACEOUS EARTH FILTER |
| Filter aid (Diatomaceous Earth)                                    | None needed                     | \$                                      |
| Cost of disposal of spent filter aid                               | None needed                     | \$                                      |
| Labor cost for precoat & service or backwash                       | None needed                     | \$                                      |
| Cost of backwash water and waste treat for 300 gallons.            | \$                              | \$                                      |
| Total cost   | \$                              | \$                                      |
| Savings with TITAN-90  |                                 |   |

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