# CASE STUDY: Hankison International

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|---|---|
| Location: | Newport, NC (Carteret County) |
| Industry: | Compressed air dryer and filter products manufacturing (SIC: 3569) |
| Pollution Prevention Application: | Evaporator installed on powder coater |
| Challenge Grant: | $15,000 |
| Annual Savings: | $227,000 |
| Payback Period: | Less than 2 months |
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## Background

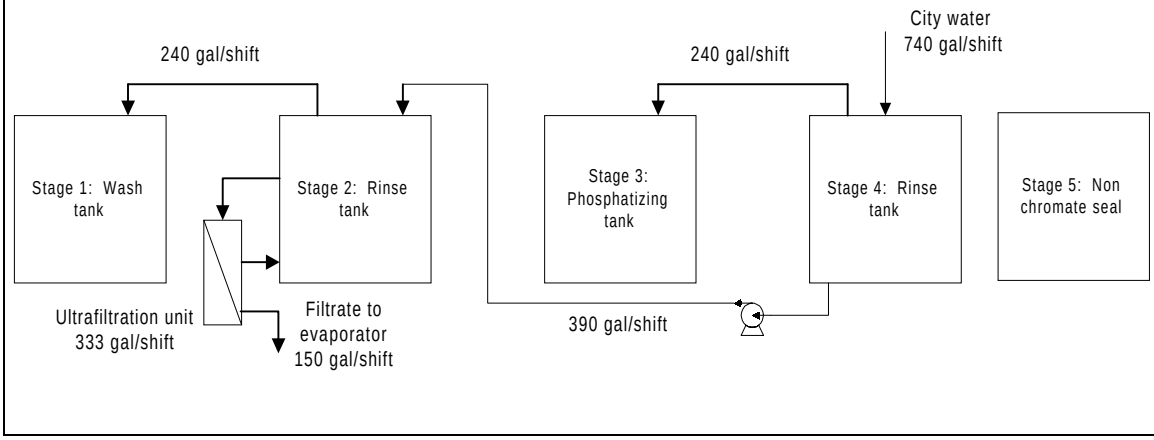
Hankison International's Newport plant manufactures filter products and refrigerated air dryers for the compressed air industry. In 1995, the company installed a new powder coater to coat the external surfaces of these devices. (The powder coater itself emits no VOCs and is excluded from Title V air permit requirements.) The production process includes a five stage cleaning line followed by the coating operation. Pre-installation planning indicated the cleaning line would consume 740 gallons of water per day; however, no public sewer was available and the area has high groundwater tables. Furthermore, the high cost of off-site wastewater disposal was prohibitive. These factors limited the wastewater management options and led the company to implement water conservation strategies and an innovative evaporation system utilizing waste heat from the powder coater oven.

## Waste Reduction Activities

- Water Conservation Strategies

A countercurrent rinse configuration was adopted between the 2 rinse tanks on the cleaning line. Countercurrent rinses significantly reduce water consumption (Figure 1). To further extend rinsewater life, an ultrafiltration system was installed on the first rinse stage. This removes contaminants from the water, enabling continued use.

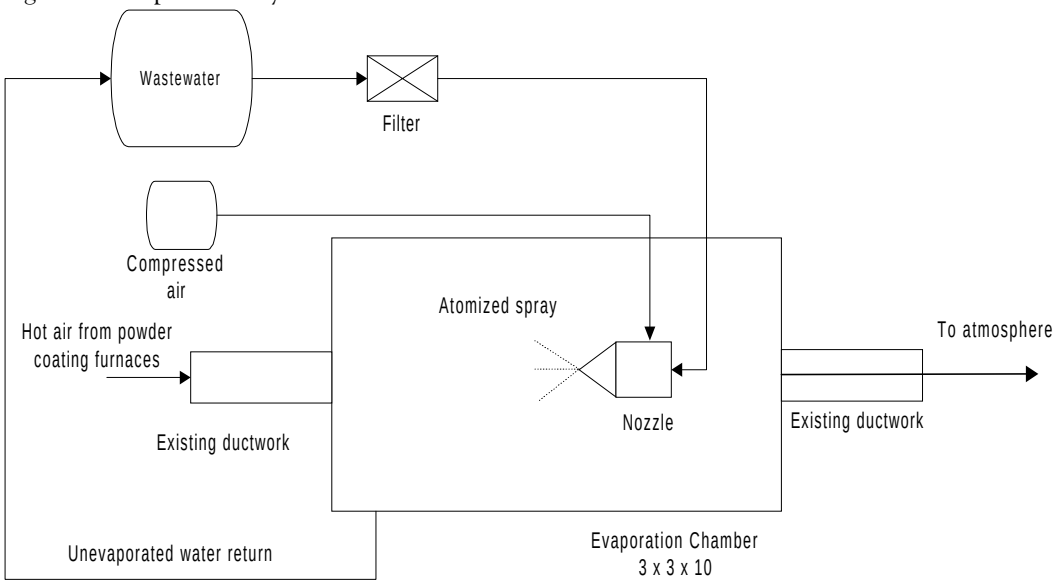
FIGURE 1: COUNTER CURRENT RINSE CONFIGURATION FOR THE CLEANING LINE.



- Wastewater Handling

The powder coating system includes a 90-foot curing oven. The company elected to utilize this oven's waste heat to evaporate excess water from the final rinse stage. Hankison modified their ductwork to include a 3' x 3' x 10' box-like chamber on the facility roof (see Figure 2). Overflowing rinse water initially passes through a 75-micron filter and is then sprayed into the 300 degree Fahrenheit waste heat stream via an air-assisted nozzle. The water converts to steam and is released into the atmosphere.

Figure 2: Evaporation system - duct work modification.




## Waste Reduced and Annual Savings

Table 1 is an economic breakdown of the projects implemented at Hankison. Payback periods are based on the reduced consumption of city water and the avoided costs for offsite treatment and disposal of the wastewater.

TABLE 1: ECONOMIC BREAKDOWN OF PROJECTS.

| Modification | Capital cost ($) | Annual Operating costs ($/yr) | Water conserved (gal/yr) | City water cost savings ($/yr)[1] | Savings on treatment costs ($/yr)[2] | Payback period (months) |
|---|---|---|---|---|---|---|
| Countercurrent rinse system | 500 | 0 | 217,500 | 1,011.4 | 108,576 | 0.1 |
| Ultrafiltration unit | 30,000 | 1,000 | 250,000 | 1,162.5 | 124,800 | 2.9 |
| Evaporation system | 10,000 | 500 | na | na | 42,000[3] | 2.9 |
| Totals | 40,500 | 1,500 | 467,500 | 2,173.9 | 275,376 | 1.8 |

[1] City water cost $4.65/1000 gallons

[2] A cost of $0.43/ gallon for off site hauling and pretreatment would have been incurred by Hankison if the generation of this wastewater had not been avoided by the project's implementation.

[3] The evaporation system enables the facility to harness 3,000,000 BTUs of waste heat which is used to evaporate 280 gallons of wastewater per shift (approx. 500 gals/day).

Payback periods on all projects were extremely fast and the payback on the countercurrent rinse system was almost instantaneous. Total capital costs amounted to $40,500 and total cost savings were $277,550. Thus the payback period on this investment was less than 2 months.

Additionally, 467,000 gallons of water are conserved annually. It should be noted that this economic breakdown does not include the capital saved on an alternate wastewater management option of a reverse osmosis treatment unit and groundwater discharge. The cost of the discharge permit alone was $150,000 with annual maintenance costs of $25,000 - $50,000.