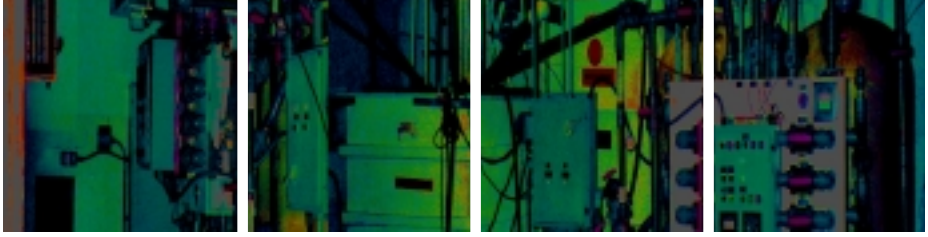


success stories

PROJECTS THAT REDUCE POLLUTION AND WASTEWATER

Highlights:

Dynamic Details Incorporated
"The global time to market solution"
1831 TAROB COURT • MILPITAS, CALIFORNIA 95035

Dynamic Details had to reduce demand for fresh water from their existing processes in order to continue to grow.

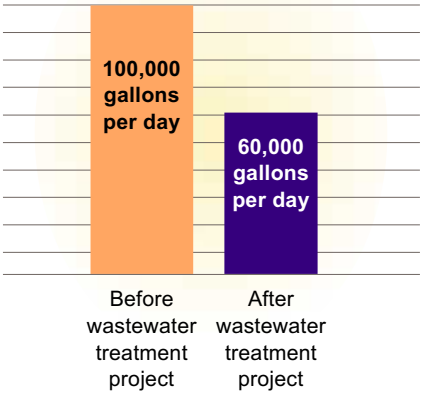
Project: Ion exchange system to recycle plating rinsewater

Equipment & installation costs: $125,000

Project challenges: Some rinses were incompatible with the system.

Payback: One month

DDI Daily Water Use



An estimated 30 gpm reduction in water use was achieved, saving over 40,000 gallons of water per day.

Dynamic Details: Savings Were in the Details

DYNAMIC DETAILS, a manufacturer of quick-turn prototype printed circuit boards located in Milpitas, California, has implemented a number of pollution prevention and flow reduction projects over the past ten years. As a result of their efforts, they were awarded the California Water Environment Association's Large Industrial Plant of the Year Award in 1995 and 2000. One of the largest reductions in Dynamic Details' water use was the installation of a system to recycle rinsewater from their plating lines.

Problem:

In 1996, Dynamic Details grew very quickly. The increase in demand for their products meant additional process lines were needed, with a subsequent increase in water use. Manufacturing operations ran around the clock. The amount of water needed rapidly approached the capacity of their existing water supply line. Increasing the capacity of the water supply line was not a viable option due to a very high cost. Dynamic Details needed to reduce demand for fresh water from their existing processes in order to continue to grow at this location.

Solution:

Dynamic Details began to look for ways to save water, scrutinizing every wet process in the facility for water conservation opportunities. The goal was to find changes that would pay for themselves in less than a year. The rinsewater used during plating was identified as one of the largest uses of water in the facility. Although a variety of measures were already in place to reduce the amount of rinsewater used, they decided to do more.

Dynamic Details investigated the use of ion exchange to remove metals from plating rinsewater, allowing the treated water to be recycled. They negotiated with Memtek, a water treatment equipment company marketing a new line of ion exchange products, and bought a prototype system for approximately $100,000. The final installed system consisted of two parallel sets of ion exchange resin (one cationic and one anionic resin column each), a carbon filter, two bag filters, two pumps, a tank each for supply and product water, regeneration chemicals, and all the associated piping and instrumentation (See Figure 1). One set of resin columns is in use while the other is being regenerated or is idle. The total cost of the system, including all piping and installation, was approximately $125,000.

Dynamic Details' staff installed the system in about a month, with a few modifications. The piping throughout the shop was installed so that city water feed could be restored by turning some valves. This allowed the system to be brought online without disrupting the production through the plating lines. The dual piping also ensures water can be supplied to the plating lines in the event of an ion exchange system failure.

Even without the capacity increase, significant cost savings were achieved by reducing water purchases, wastewater treatment costs, and sewer use fees.

Challenges:

The supplier had overstated the ability of the system to successfully treat certain rinses. For instance, fluoride in the lead plating solution caused precipitation in some of the rinse tanks and unacceptable turbidity. Some rinses had excessive organics, surfactants, or chelating agents, which fouled the ion exchange resin. The time between resin regenerations was much shorter than expected.

It took more than six months of trial and error to determine which rinses could remain plumbed through the system and get the recycled water quality to a consistently high level. MSDSs were reviewed to try to identify the chemicals causing problems. Suspect rinses were removed from the system and the problem areas were monitored for any improvements. Rinses that proved to inhibit system performance, like cleaning process rinses containing surfactants, were permanently removed. The rinses left on the system are the waste streams containing mainly copper. Each ion exchange resin column now lasts two to three days between regenerations. The overall quality of rinsewater is better than the original city water feed since most of the ions have been removed except the copper added during plating. The conductivity of the product water is monitored and is significantly lower than city water.

Results:

The system paid for itself within one month through Dynamic Details' ability to increase production. Even without the capacity increase, significant cost savings were achieved by reducing water purchases, wastewater treatment costs, and sewer use fees. The water savings alone would have paid for the system within six months. A variety of rinses from the cuposit, electroplating, etch, and strip lines were recycled. The system allowed them to set the flow rates through the rinse tanks at a fixed level higher than before, which resulted in an improvement in rinse quality and allowed the elimination of on/off switches and flow restrictors. This took the water conservation measures out of the platers' control and made the plating process more foolproof and consistent. The system recycles 40 gallons per minute (gpm) of rinsewater, and an estimated 30 gpm reduction in water use was achieved, saving over 40,000 gallons of water per day. Although some basic training was necessary for the waste treatment operators to oversee the system and know how to respond to any alarms, very little time is spent monitoring the completely automated system.

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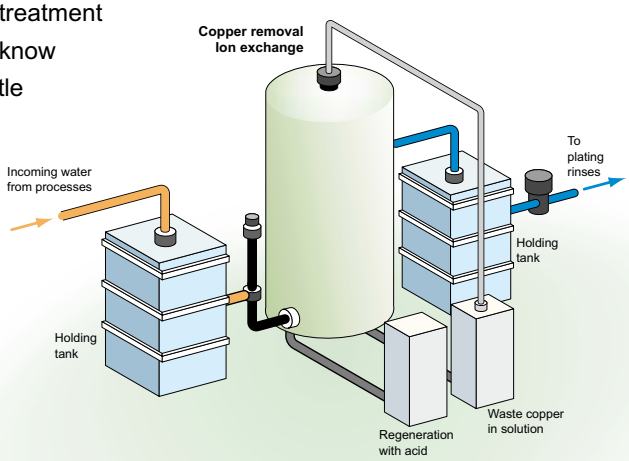
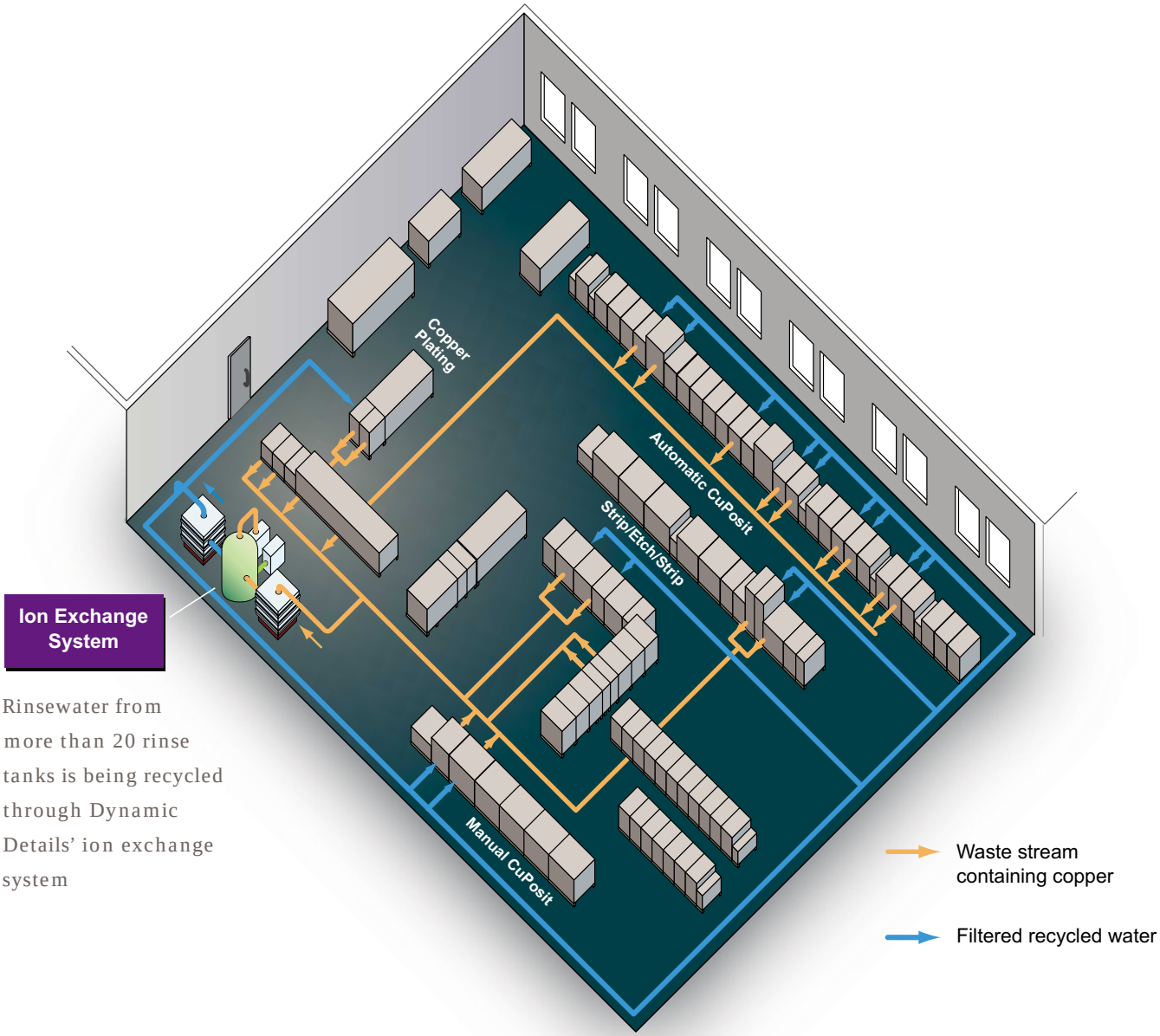


Figure 1:
Copper removal ion exchange system

DYNAMIC DETAILS INCORPORATED

Plating Shop



Rinsewater from more than 20 rinse tanks is being recycled through Dynamic Details' ion exchange system

Summary The installation of this rinsewater recycling system allowed Dynamic Details to increase their production rate without increasing their overall wastewater discharge rate. The system paid for itself in only a month. The ability to run the rinses at a higher flow rate using higher quality rinsewater improved the plating results. They found that care should be taken in selecting which rinses to recycle. Overall, Dynamic Details was so pleased with the performance of this system that they installed a similar one on some of their higher quality rinses in the gold tip line.

Thanks to Marino Finley, Environmental Manager for Dynamic Details, for his assistance in preparing this case study.

success stories

The San Jose / Santa Clara Water Pollution Control Plant discharges treated wastewater into South San Francisco Bay. This area of the Bay is shallow, with a limited amount of tidal and tributary flushing. This creates unique challenges for the Plant in protecting the health of the South Bay. The Plant has been ordered by the Regional Water Quality Control Board to reduce its dry weather effluent flow, as well as the amount of copper and nickel discharged, in order to preserve endangered species' habitat and to meet state and federal water quality objectives.

To comply with these and other regulatory requirements, the City of San José has implemented a variety of programs improving water quality in the South Bay. These success stories demonstrate ways local companies have been able to reduce wastewater discharge or pollutants from their facilities.

San José offers financial incentives and other programs to encourage the implementation of such projects, including Water Efficient Technologies (WET). The WET program offers rebates of up to $50,000 for reductions in wastewater discharge. Participants must apply before beginning a project, and they must document the amount of wastewater reduced as a result of the project.

For more information on WET or project success stories, call (408) 945-3700 or go to www.slowtheflow.com.

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

SAN JOSE/SANTA CLARA
WATER POLLUTION
CONTROL PLANT

In accordance with the Americans with Disabilities Act, City of San José Environmental Services Department materials can be made available upon request in alternative formats, such as large print, audio tape or computer disk. Requests may be made by calling (408) 277-5533 (V) or (800) 735-2929 (CRS).

Oct 2002/XXXK/xxxx/JMc