



A COMMERCIAL APPLICATION OF VIROFLOW™ TECHNOLOGY

CASE STUDY: CP PLATING

*“As a result of implementing ViroFlow™ Technology,
CP Plating is now in a position to recycle the water
used in the electroplating process.”*



*Treated process water on left and raw process water
on right (above)
View of installed water treatment system (left)*

>>> CASE STUDY: CP PLATING

PROBLEM

CP Plating is a large electroplating company in Brisbane, Queensland, which specialises in zinc plating but also does chrome plating and powder coating. CP Plating approached Virotec after reading about the remarkable ability of ViroFlow™ Technology to remove heavy metals from electroplating industry process water. The outcome required by CP Plating involved performance optimisation of their existing wastewater treatment process.



Figure 1: View of installed water treatment system

VIROTEC TOTAL SOLUTION

ViroFlow™ Technology, a total solution service that includes reagents, technical support and liaison with regulatory authorities, was implemented with the following outcomes:

- > Substantial reduction in heavy metal concentrations in water discharged as trade waste and full compliance with Queensland Water trade waste discharge limits;
- > A treated water quality that was good enough to allow the water to be reused in the electroplating process thereby reducing the need to purchase town supply water;
- > A more robust wastewater system that, allowed CP Plating to discharge resins and other chemicals, without affecting the ability of the treatment system to remove heavy metals;
- > Potential for re-classification of the sludge to “Non-Prescribed” waste, allowing for possible solids re-use or recycling and greatly reducing disposal/management costs;
- > Increased dewatering efficiency resulting in improved water quality and increased plant throughput;
- > A substantial saving in chemical treatment costs by eliminating the use of expensive polymer flocculants.

>>> CASE STUDY: CP PLATING

BACKGROUND

CP Plating started their business in 1985. Most of their business involves zinc plating and they process around 250 tonnes of steel per month. However, they also specialize in chrome plating and powder coating, which represent about 30% of their business. They use three electroplating processes, these being;

- 1) rack line with acid and alkaline zinc processes, the alkaline zinc process is more environmentally friendly;
- 2) auto line with alkaline zinc process, having a 25,000 L capacity; and
- 3) a barrel line acid process, having a 4,000 L capacity. A total of 65% of the water requirements for plant operation is met by recycled water that has to have very low metal concentrations so as to not disrupt the electroplating process.

TREATMENT METHODS

ViroFlow™ Technology incorporates the use of ElectroBind™ reagent, a patented environmentally safe reagent. The properties of ElectroBind™ include a high acid neutralising capacity, improved flocculation and fast settling rate characteristics, reduced sludge volumes, and a high metal binding efficiency.

ElectroBind™ reagent was mixed with the electroplating plant wastewater at a predetermined volume-to-mass ratio to ensure optimum contact time and treatment efficiency. ViroFlow™ Technology replaced the conventional treatment process and produced a dense, stable sediment that was easily recovered and dewatered.

The requirements for adopting ViroFlow™ Technology were compatible with the existing treatment facilities and required no capital works or plant modifications.

Figure 3 shows treated effluent quality before and after addition of ElectroBind™ reagent and it is clear that the use of ElectroBind™ greatly improved water clarity.



Figure 2: Clarifier tanks (right and left)

>>> CASE STUDY: CP PLATING

RESULTS

During the application of ViroFlow™ Technology, metal concentrations in the treated water were consistently below the Brisbane Water trade waste discharge limits. The discharge limits for the relevant metals are shown in Table 1.

TABLE 1: METAL CONCENTRATIONS BEFORE AND AFTER ELECTROBIND™ REAGENT ADDITION.

Parameter	Before ElectroBind™ addition (mg/L)	After ElectroBind™ addition (mg/L)	Discharge Limits (mg/L)
Chromium	0.138	0.04	10
Copper	4.17	0.05	10
Iron	3.64	0.1	100
Nickel	2.54	0.22	10
Zinc	3.36	0.52	10



Figure 3: Treated process water (left) and raw process water (right).

>>> CASE STUDY: CP PLATING

Although metal concentrations in the untreated water complied with discharge limits they were too high for the water to be reused in the electroplating plant. The use of ElectroBind™ reagent lowered all metal concentrations in the water sufficiently to allow the water to be reused in the electroplating process thereby reducing the need for make-up water. Figure 3 shows the visible difference between the raw effluent and the effluent treated with ElectroBind™ reagent.



Figure 4: Treated water discharge

CONCLUSION

The use of ViroFlow™ Technology to treat electroplating plant effluent is both environmentally sustainable and economically viable. Treated water quality, after the application of ViroFlow™ Technology, complies with the trade waste limits imposed by Queensland water authorities. All metal concentrations are several orders of magnitude below the discharge standards set by Queensland Water and represent a substantial improvement compared to the former treatment.

>>> CASE STUDY: CP PLATING

The visual clarity of the treated effluent is also far superior to that achieved previously. CP Plating is now able to reuse the recycled water in their processing plant, greatly reducing the need to purchase town water. ElectroBind™ reagent is non-toxic, non-hazardous and environmentally safe, and the spent reagent can be disposed of to land fill as a non-hazardous waste material.

TESTIMONIAL

“Due to increasing water costs, and strict water restrictions CP Plating in Brisbane was investigating water reuse options due to the large volumes of water used in the process. It was found that any reuse options were limited due to the moderate metal levels produced by the existing wastewater treatment process, and many other treatment methods were non-cost effective.

The company heard about Virotec’s ViroFlow™ Technology and started using it to permanently bind up metals in the process water so it could be reused in the plant. As a result of implementing ViroFlow™ Technology, CP Plating is now in a position to recycle the water used in the electroplating process. CP Plating is using Virotec’s ViroFlow™ Technology on a permanent basis and are achieving consistently excellent results.

I would recommend Virotec’s ViroFlow™ Technology to anyone in the electroplating industry who is having similar problems to those we used to have.”

**Chris Burgess,
Managing Director of CP Plating
Brisbane, Queensland.**