



## **Sustainable Water Reuse Case Study/Article – Paint/Pigment Industry**

### **Introduction**

The paint/pigment industry is a large consumer of process and wash water to be used in various water based paint pigment products. The water usage for this industry is estimated at 75-85 million gallons per day, with the majority of this water coming from municipal or public supply followed by well water and surface water sources.

Only about 4% of the total water used in the production of paints is recycled worldwide. Nearly, 70% of the total wastewater is discharge untreated with nearly 25% not discharged, but disposed of by evaporation or some other method.

Most of the wastewater generated in paint/pigment production facility operations results from the cleaning of the equipment used to manufacture water-based paints. The types of equipment most frequently cleaned are mixers, thinning tanks, tinting and filling machines. Other sources of wastewater generated in these operations include the cleaning of equipment used in the preparation of resins, solvent-based paints, and other products as required.

### **Paint/Pigment Waste Water Composition**

The wastewater composition generated by the paint/pigment industry tends to vary in concentrations of BOD (biological oxygen demand) or COD (chemical oxygen demand), suspended solids, toxic compounds such as VOC's and color. The levels of BOD/COD can range from 500ppm to 13000ppm.

The discharge of such wastewater into the environment impedes light penetration, damages the quality of the receiving streams and may be toxic to treatment processes, to food chain organisms and to aquatic life.

### **Sustainable Reuse in Paint/Pigment Industry**

Recently, over the past few years there has been several changes due to environmental regulations and consumer preference for paints containing lower volatile organic compounds (VOC), no smell, and the reduction of toxic heavy metal solvent coatings.

Sustainability efforts moving forward will continue to focus on opportunities to reuse the process water and wash water in applications such as cooling tower water or even process water for paint/pigment production.

Waste minimalization is making significant inroads into paint/pigment manufacturing facilities. Since equipment washing operations is the largest source of wastewater production in the industry, utilization of a sustainable wastewater treatment reuse solution such as the GWT specialized electrocoagulation system can be an answer to solve this issue and enable water reuse. This water could be utilized for



cooling towers or potentially other ongoing process water treatment requirements in the facility. This process would result in potential savings of greater than 40% over previous water/solids disposal costs.

As companies in this industry move toward pursuing sustainability goals to reduce operational costs and comply with increasingly stricter regulations, it is becoming apparent that water reuse is one of the key component of these initiatives.

Paint/Pigment companies often produce waste water containing elevated levels of suspended solids and color from their operations, in addition to non biodegradable contaminants. Based on the levels of constituent contaminants discharged, the higher the municipal waste water disposal surcharge costs for the paint manufacturer. Reusing this water can provide a significant return on investment for paint/pigment producers not only through the removal of these wastewater surcharges but through the reduction of the cost to purchase fresh water as well.

GWT specialized electrocoagulation wastewater treatment solutions are demonstrating their value in installations in paint/pigment industry water reuse applications from eliminating or drastically reducing chemical costs to significantly reducing sludge disposal costs and consumables expenses for secondary and tertiary treatment equipment.

## **Future Trends**

- Water reuse and sustainability will continue to be important goals for environmental pollution prevention reduction practices in the paint/pigment industry.
- The paint/pigment industry will continue to choose and utilize advanced innovative water treatment solutions not only to reduce their operating costs, but to reduce their water footprint and decrease the ecological impact from their waste water discharge and solids sludge generation on the surrounding ecosystem.
- Wastewater treatment process optimization will continue to be a key focal point for paint/pigment industry companies as the costs of waste water disposal and fresh water consumption continues to escalate due to issues involving water scarcity.
- An increasingly growing and progressively affluent global population, demands on our global water resources will necessitate higher water costs and stricter regulations. This is propelling paint and pigment companies and their discharging municipalities alike to re-evaluate their practices and push toward a more sustainable future.
- We anticipate that optimizing more efficient methods coupled with advanced treatment solutions to treat and reuse waste water and process water will remain one of the most important points of paint and pigment manufacturing companies around the world into the future.

## **Case Study – Paint/Pigment Wastewater Treatment & Reuse**



## **Challenge**

A large paint/pigment company specializing in organic paints and pigment coating for cars and commercial applications wanted to reduce their operating & discharge costs to meet more stricter discharge standards. The company had been using chemical coagulants/flocculants, however, this approach has generated substantial sludge volumes and discharge costs. Therefore, they were looking for a sustainable solution that could meet their discharge requirements while reducing operating and sludge discharge costs. The initial COD levels prior to treatment were reaching 12,040mg/l composed mainly of color and organic constituents.

## **Solution**

Genesis Water Technologies with its local partner designed and provided a solution to effectively handle their water streams.

The raw effluent was prescreened and pumped from a primary holding tank to remove coarse organic solids. This prescreened influent was sent to a GWT specialized electrocoagulation (ECG) system which was followed by secondary clarification via a settling clarification using GWT Zeoturb flocculant medium.

Tertiary treatment included post micron filtration to remove any remaining coagulated color/particulates in the water.

## **Benefits/Results**

70% reduction in discharge costs. Additional operating cost reductions were witnessed from the reduction of fresh water consumption from cooling water and cleaning water usage. The water was reused for cooling tower water treatment and cleaning/wash water applications in the facility.

Discharge compliance will be maintained in the clients operation, with a reduction in sludge disposal costs over previous treatment approach which increased the clients return on investment.

The results after treatment were reported by a third party laboratory analysis to be 406 mg/l, a reduction of almost 97% in this application.