

CHEMICAL & PHARMA

Waste Water Treatment Solutions



CASE STUDY

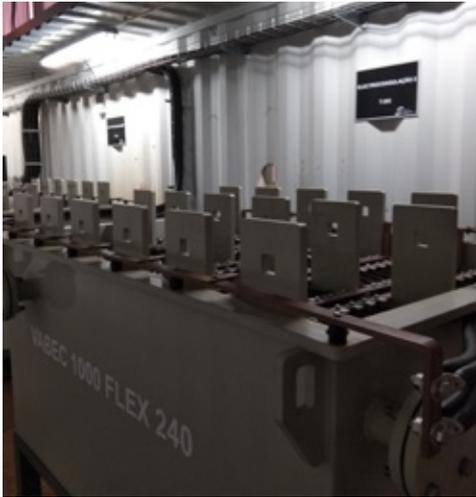
In recent years, the number, variety, and composition of **synthetic chemical compounds** have increased tremendously. Their use has influenced every aspect of modern life. A particularly widespread group of chemical compounds are **phenolic resins** (phenol-formaldehyde resins or bakelite). They have been reported to have high stability and high environmental toxicity. Additionally, carcinogenic properties can damage human health seriously. The phenol formaldehyde resin producing industries generate **wastewater with a high concentration of organic matter**. Such wastewaters are difficult to be treated by biological processes when the phenol is present at high concentration. The reason is that it causes inhibition to the normal function of the microbial population.

What do they do?

Our customer is a well-known player in the **resin industry worldwide**. It is a major supplier to adhesives, food & beverage, rubber and inks companies.

What are they trying to achieve?

Several methods have been used to treat wastewater containing phenol and formaldehyde compounds. Amongst these methods, the **electrochemical processes** are the best treatment methods for partial or total degradation of toxic organic substances. Given the data presented resulting from all tests and trials carried out on effluent samples, we understand that the viable, efficient technical solution, accessible driving and with an adequate economic balance consists of the **combination of an aggressive chemical pre-treatment, based on electrochemical technology**.



SOLUTION

The key to overcoming these problems lies in oxidative pre-treatment, such as adding **electrocoagulation (EC)** process before a biological one. EC is an electro-chemical process that removes suspended, emulsified or dissolved contaminants from water using an electric flow of charge. It generates a direct flow of charge to free into the liquid the metal ions from sacrificial anodes that will **remove undesirable contaminants**.

After the electrochemical reaction, the separation of the sludge thus formed will be carried out in a special flotation unit (DOF), innovative and unique equipment based on the **ozone saturation process**. Ozone saturated water will recirculate within the system and generate extra oxidation of the treated effluent together with sludge separation by flotation.

To allow the degradation of the components, constituted by phenolic chains of oxidation and difficult degradation, a biological treatment unit was applied, with **MBBR technology** ("Moving Bed Biofilm Reactor") to guarantee efficiency, in compliance with discharge parameters. This treatment **guarantees a more compact design** compared to another traditional biological solution.

RESULTS

These technologies combined allowed for the **total removal of formaldehyde** and consequently, COD and BOD with a 99% removal. With these results, **operating costs decreased a lot** because all wastewater was being directed to a hazardous waste management company that charged for the transportation and treatment of the effluent. Such advantages in the cost of operation and construction will have a **considerable weight on the economic balance** of the project, in global terms.



DATA RESULTS:

	Inlet	Outlet	
COD	200 000	- 1000	mg/L
FORMALDEHYDE	120 000	- <120	mg/L

