

Treatment technologies of electroplating processes wastewater. New treatment methods of electroplating process effluents in the closed water cycle.

ABSTRACT

Electroplating industry is characterized by high water consumption. The technology of process water recovery implemented by P.W. Galkor sp. z o.o. enables to achieve a high level of pre-treatment of wastewater from electroplating processes, which allows to reuse it as technological water. A properly designed process of wastewater neutralisation and further subsequent stages of pre-treatment enable to direct the initially treated wastewater to membrane installations that allow to obtain the water suitable for reuse in the electroplating line.

The purpose of PhD studies was the verification of technological assumptions operating in the systems used so far and the proposal of new solutions that lead to the optimisation of technological water recovery system and thereby the increase of the cost-effectiveness of the technology offered by P.W. Galkor sp. z o.o. On the basis of the verification, the critical points were identified which modification was promising for obtaining better results in terms of the technological water recovery optimisation in an electroplating plant. The variety of identified problems required to divide the experimental part into the work in the field of oil contaminants, the development of tools for the appropriate water and sewage management in the electroplating plant, the reduction in quantity of wastewater from electroplating plants and wastes from technological water recovery system.

As a part of the completed PhD, the following solutions were developed and implemented that allowed for:

- The efficient elimination of oil contaminants from electroplating baths and rinse waters;
- The development of algorithms for the appropriate water and sewage management in the electroplating plant including the possibility of wastewater neutralisation process automation;
- The reduction of heavy metals concentration in rinse waters.

The result is the significant reduction of water consumption of electroplating processes carried out based on the technology offered by P.W. Galkor sp. z o.o.