

THE CASE STUDY DESCRIBES INCREASING OF THE ECONOMIC AND TECHNOLOGICAL TREATMENT EFFICIENCY OF WASTEWATER CONTAINING DYES BY MODERNISING THE WASTEWATER TREATMENT PROCESS TECHNOLOGY

MODERNIZATION OF WASTEWATER TREATMENT FACILITIES AT THE DECORATIVE PRINTING

Poland 2020

FLOWRATE	25 m ³ /day
SITE	Local wastewater treatment plant (WWTP) of the decorative printing plant
WW GENERATION SOURCES	Industrial wastewater from production machines and tank washing
YEAR OF COMMISSIONING	2020

INTRODUCTION:

The local wastewater treatment facilities of the decorative printing plant included stages of buffering, physical-chemical and biological treatment. The treated wastewater was discharged to the municipal sewer system. Despite the diligent operation of WWTP and high operating costs of chemicals, the treatment efficiency often did not meet the requirements for its discharge. For example, according to the municipal wastewater treatment plant discharge requirements, the maximum allowed concentration of the chemical oxygen demand (COD) should not exceed 1500 mg/l, when in fact it could reach 2000-3000 mg/l. Realising the need for increasing the WW treatment efficiency, the printing plant appealed to PRODEKO-EŁK Sp. z o.o., the part of the EKOTON Industrial Group, with a request to carry out an inspection of existing process technology and a corresponding WW treatment study to make a conclusion on the required modernisation of the WWTP.

PROJECT IMPLEMENTATION:

Upon the appeal, EKOTON technologists visited the plant's treatment facilities, inspected the wastewater treatment site and took wastewater samples in order to conduct a detailed study on the efficiency of their possible treatment method. During the inspection and study, it was found that the existing wastewater treatment process does not correspond to the wastewater composition, and therefore the process technology should be changed. The technologists have proposed to use a flocculation process with dosing of aluminium coagulants with low chloride-ion content and polyacrylamide-based anionic flocculant (PAA). Such treatment allowed to remove a significant part of all contaminants which were in colloidal form, leaving dissolved organic matter in the filtrate, which could then be safely transferred to the next stage of biological treatment without harming the activity of microorganisms.

The designed treatment technology was tested several times in the laboratory and then repeated as an industrial-scale study. After the experimental approval of its high efficiency, the representatives of both companies proceeded to a technical

discussion regarding the modernisation of the treatment facilities with possibility of saving the existing equipment. As a result of individual approach to the project, it was succeeded to found the optimal solution and to implement it with the lowest capital costs. Representatives of both companies worked side by side to launch and adjust the process. All additional customer requirements and demands were fulfilled to make the operation process as easy and convenient as possible.

RESULTS AND CONCLUSIONS:

Owing to the carried out comprehensive study of existing treatment facilities and individual approach to the client, the optimal technological solution for the modernisation of the WWTP was found giving high treatment efficiency with minimal capital expenses. After launching and setting up the whole process, it was possible to achieve the quality requirements for the discharge into the municipal sewer system. The modernisation included simplification and operation automation of the entire technological process; operating costs reduction; improvement of the chemical dosing system and implementation of the intelligent dosing and flocculation technology; customisation and automation of the chamber filter-press and the whole dewatering process; increasing the flexibility of regulating and adjusting of the overall treatment processes.

