



# Operating Experiences with the First Czech Application of MBBR Technology for Treatment of Industrial Wastewaters in CHBČOV Draslovka Kolín

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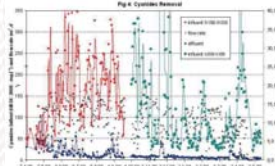
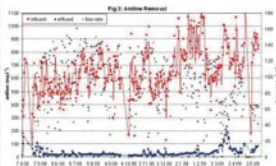
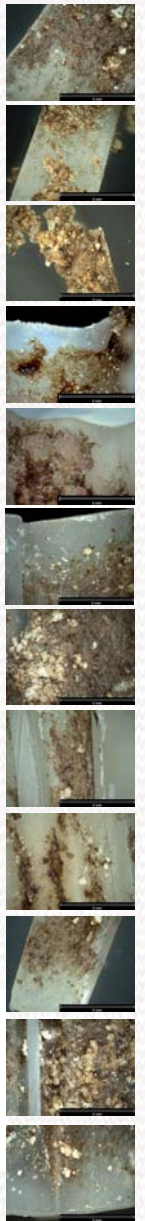
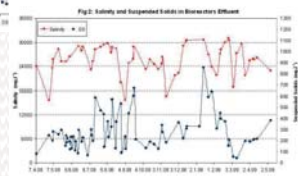
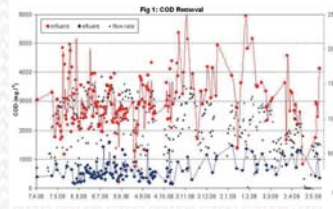
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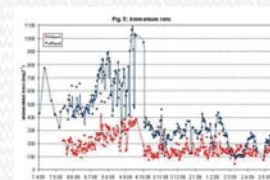
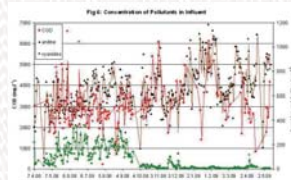
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Wastewater containing cyanides, toxic organics and extremely high salinity from parts of the production facilities of Lučební závody Draslovka Kolín (production of diphenylguanidine /DPG/ accelerator of rubber vulcanization) were not being treated properly. Only cyanides were precipitated with iron salts to stable complex (berlin blue). Small-scale biological treatment of wastewaters using biofilm process, subsequent pilot tests carried out in the plant (with real carrier of biomass - Kaldnes™) revealed satisfactory results and the construction of a chemical-biological wastewater treatment plant was planned, designed and subsequently carried out. This WWTP is the first application of Moving Bed Biofilm Reactor technology (MBBR) in the Czech Republic, which is currently in full scale operation. All produced wastewaters are treated in accordance with designed effluent concentrations.

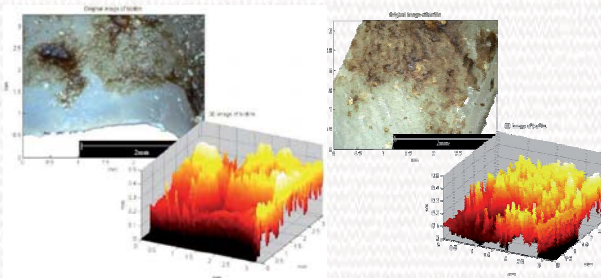


The reconstruction of the production unit enabled the plant to increase production twofold (from 900 t/year to almost 2000 t/year) together with the implementation of a safety system for wastewater treatment and brings the following annual benefits: increased turnover of the company, decreased consumption of chemicals, particularly hydrogen cyanide, chlorine for chlorocyan synthesis and iron salts for precipitation of cyanides from wastewaters. Implementation of modern technological improvement and physical pretreatment directly in the production unit stabilized the quality of products and provided essential stability of wastewaters for biological treatment. Implementation of new type of biological treatment (practically non-waste) for components in the wastewater previously treated with very low efficiency (for organics), now with high efficiency (cyanide 99% with 200 mg/l input, aniline 90% with 1000 mg/l input, COD 60-80% with 3-4g/l input) leads to a decrease in wastewater discharge levels and a decrease in the production of waste sludge.

Implementation of physical-chemical pre-treatment and biological treatment of wastewaters also resulted in the possibility to innovate and increase production of the plant. Therefore, the plant management decided to combine the innovation/enlargement of production with the construction of this new WWTP. The whole investment deals with modernization of intermediate chlorocyan and DPG production with the aim of increasing process safety, production capacity, and continuity of chlorocyan production. The environmental safety of production is secured by low-waste combined physical-chemical and biological treatment of wastewater in the newly established WWTP. Diphenylguanidine is a highly sophisticated component used in the rubber industry (tire production) costing approx. 2500 EUR per ton.



Implementation of new water treatment technology enabled the plant to fulfill the requirements of the Integrated Pollution Prevention and Control (IPPC) Act, as well as the requirements of the new Water and Waste Acts. The company produces about 20 % of the worldwide production of DPG and DPG is one of two key product of the company. The DPG market is stable and has an annual increase of approx. 5 %. The prognoses revealed the same increase in demand of DPG in the coming years. Investment into modernizing the production and improvement of the wastewater treatment create the possibility for sustainable development of the company.



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