
First details on the ProAquaPlus system for a closed paper mill

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With the Taurus PM3 project in Sandersdorf-Brehna, the Prougroup AG is consistently continuing its Two Twentyfive strategy and is making a significant contribution to the protection of the environment and resources in the course of the green high-tech philosophy.

Together with the paper machine manufacturer Voith and its subsidiary Meri, a plant concept was developed which produces corrugated base paper with an annual output of 750,000 t at an operating speed of 1,600 m/min. The required raw material input is 860,000 t/a recovered paper from 100% recycling. The basis weight is between 80 and 150 g/m². In addition to the machine concept, the Progroup also relies on an internal "ProAquaPlus" process water treatment system for the PM3.

This closed loop water treatment concept is made possible by intensive loop separation, extensive measures for reducing the fresh water requirement through complete recirculation of the process water and thus no waste water from paper production is discharged. For this purpose, the stock suspension from stock preparation is thickened to a stock consistency of 30 % at the transition to the paper machine circuit, thus avoiding the use of highly oxidative biocide systems on the paper machine.

To make this concept possible and to achieve a specific fresh water consumption of approx. 1.2 m³ pure water/t finished paper, a waste water treatment plant was designed together with Meri Environmental Solutions. In addition to a pre-acidification and the anaerobic R2S reactors, the process known as biological kidney includes a stripping process for targeted lime precipitation and subsequent microflotation for targeted lime separation.

The aim of this biological kidney is, on the one hand, to break down the impurities in the water and thereby reduce the COD and, on the other hand, to remove the calcium carbonate from the process water through the stripping process. Biogas is produced as a by-product. This is used for steam generation in the company's own boiler house, where it replaces up to 10 % of the natural gas required.

In order to be able to successfully implement and commission this concept, various operating conditions were tested in advance in a diploma thesis at the Technical University of Dresden in the Department of Paper Technology and examined on a laboratory scale to determine which process water, especially in the area of corrugated board base paper with a high recycled content, is suitable for use in this wastewater treatment plant. Special attention was paid to changes in anaerobic degradation and to the effectiveness of the subsequent stripping process.
