

RECIRCULATION OF PROCESS WATER IN A WET FERMENTATION OF OFMSW

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Abstract

The MBT plant of Freienhufen is used to stabilize residual waste. Since the rural districts Elbe - Elster and Oberspreewald - Lausitz match their waste management with federal law, oFMSW will be collected separately in future. Hence the AD process has to be converted. The accomplishment has to refer to the existing operating regime to reduce investment costs. This contains a wet fermentation. In order to facilitate the conversion of the operating process, suitable particle sizes and volumetric loads have to be examined. In addition the liquid phase of the digestate shall be recirculated maximal to save both fresh water and waste water disposal costs.

The one year lasting investigations were performed in lab-scale with a various number of reactors. Before feeding the biowaste was pre-treated. In order to that, the biowaste was milled to particle sizes of 10, 8, 4 and 2 mm. Additionally the digestate was dewatered to gain process water. While using the process water fresh water was substituted in varying proportions. The feeding of the reactors was adjusted to the standards of the operating plant. For that reason the dry matter content in the reactor was adjusted at 10.5 %. Depending on the delivered raw material, this restriction led both to unsteady water requirements and volumetric loading.

As result of the investigations an optimal particle size as well as the optimal proportion of recirculated process water shall be provided. For that reason comprehensive analyses were conducted weekly to characterise the delivered raw material as well as the solid and liquid phase of the digestate in order to determine critical moments due to recirculation of process water. In conclusion, liquid and solid phase of the digestate should be evaluated with regards to application as fertilizer.

Keywords: oFMSW, bio waste, anaerobic digestion, wet fermentation, process water, recirculation