S1.6.2 - *In-Situ Cleaning Process of Chamber Filter Presses with Sensor-controlled and Demand-Oriented Automation*

Patrick Morsch[1], Harald Anlauf[1], Dominik Geier[2], Thomas Becker[2]
[1]Karlsruhe Institute of Technology, [2]Technical University of Munich

The cleaning of plants for the chemical industry is essential to avoid cross-contamination, especially in batch operation, and therefore safe production. This is especially true for solid-liquid separation processes and especially for filtration. These apparatus have special requirements for cleaning because of the difficulty to clean surfaces for filter cloths. The cleaning of filters is therefore often designed conservatively, which is equivalent to excess cleaning. A demand-oriented cleaning method based on image evaluation offers a lot of potential for optimization in this area in particular in order to reduce the necessary cleaning agent, document the cleaning result, and reduce the amount of wastewater produced. The latter point is particularly interesting considering the trend of rising wastewater costs in recent years. The basis of this demand-oriented cleaning is the development of an optical residue detection, coupled with an automated nozzle system with a pulsatory and/or continuously operated nozzle lance for chamber filters. The cleaning process is then carried out using the following points: 1) Detection of the contaminated areas. 2) Assignment of coordinates. 3) Approaching and cleaning the defined coordinates. The combination of both components enables demand-oriented

cleaning and thus represents an efficient, optimized, and resource-saving cleaning method. The automated and demand-oriented cleaning is investigated in laboratory tests and relevant parameters are determined. Parallel to this, the algorithm for the documentation of the contamination condition is developed. The validation is carried out on chamber filter presses using model contamination. The cleaning technology presented here can thus be transferred to other filter systems (backwash filters, surface cleaning of containers, etc.), so that the research results can be used to increase purity in a wide range of applications, avoid contamination and achieve increased product safety. The current status of the project will be presented during the presentation. This includes the use of various image analysis algorithms, nozzles, filter fabrics, and cleaning techniques. In addition, an outlook is given for the transfer to further process plants.

Patrick Morsch

Patrick Morsch (M.Sc.) is a Research fellow in the Institute of Mechanical Process Engineering and Mechanics (MVM) at the Karlsruhe Institute of Technology (KIT) He received his Bachelor's of Science at the Hochschule Mannheim - University of Applied Sciences 2013, his Master's of Science at the Hochschule Mannheim - University of Applied Sciences 2015, and start as a Graduate Student in the Institute of Mechanical Process Engineering and Mechanics at Karlsrue Institute of Technology (KIT) in 2015. his research is focused on filtration technologies in solid/liquid separation with filters, and especially the regeneration after cake filtration. The focus here is on the contamination detection of filter fabrics after cake discharge in chamber filters.

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