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CLARIFICATION OF VERY LOW CONCENTRATED LIQUIDS BY „BREATHING“ CANDLE FILTERS

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ABSTRACT

Cooling lubricants and other metal working liquids usually are clarified and fed back into the process. They are often containing a very small amount of particles in the µm range. To clarify such liquids normally precoat filters or simple vacuum belt filters with non-regenerable nonwoven filter media are applied. This causes permanent extra costs of operation due to the consumption of filter media and an increased amount of waste material. If beside the clarified liquid also the separated solid material represents a valuable product, this cannot be produced in a pure form by the above mentioned techniques, because it is mixed with the precoat material or sticks in the pores of the nonwoven filter media.
As a consequence one would be interested in an economically operating and fully regenerable system for direct filtration. The concept of the company Transor Filter of periodic backflushing of expandable filter candles has proven in the industrial practice as a successfull alternative to purify cooling lubricants from hard metal grinding and polishing. The filter principle is based on filter candles consisting of a stack of paper rings, which are held together by a spring.
The Institute of MVM and Transor Filter have started a joint research project to analyze the relevant filtration mechanisms and to optimize this filtration system. A high potential for effectivity improvement and future applications in aqueous systems is to be expected. Precondition for optimization of the filter system is a careful theoretical and experimental analysis of the extraordinary complex particle deposition behavior and the internal flow pattern. Blocking filtration, depth filtration and cake filtration are taking place simultaneously and are superimposing each other. In addition the particles are exposed to gravity and try to settle down against the direction of the feed flow. Filter experiments, CFD simulations and theoretical considerations should result in a model to calculate and to scale-up the filter process for practical use and to improve the present state of the art.

BIOGRAPHY

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