

ABSTRACT

Main subject of the diploma thesis is an evaluation of waterworks sludge dewatering using the CST method. The CST or capillary suction time is method developed to evaluate specific resistance to filtration in an indirect way. In principle it is based on the use of filtration paper to measure willingness of sludge to release water or its filterability. Results are measured as time needed for the water to overcome a defined trajectory and expressed in seconds. The shorter the CST time the more filterable is the sludge sample.

The CST method has been critically evaluated and it was assessed as a great method for selecting the ideal polymer used for the sludge dewatering and for defining its optimal dose.

Measurements have been made on sludge from two waterworks plants Želivka and Kozičín. Polymer products from company Sokoflok and products Praestol and Magnafloc have been tested on both of them. The best polymers for dewatering have been selected. It was Sokoflok 104 for sludge Želivka 1, 55CN for sludge Želivka 2, Magnafloc for sludge Kozičín 1 and 55CN for sludge Kozičín 2.

Second subject of the thesis was to evaluate a sludge sensibility to the shear rate. Havlík (2003) and Bache et al.(2003) are describing sludge as a substance very sensitive to higher shear rate which causes that the aggregates break up and the filterability is reduced. Sludge conditioned with polymer and exposed to higher shear rate contained some amount of broken up aggregates, but as the CST measuring showed the conditioned sludge filterability was not affected in all cases. With some samples the filterability was even better than before applying the high shear rate. It can be said that even though high shear rate leads to aggregate break up it doesn't automatically mean that the sludge filterability is reduced, but to ascertain that further research is needed.