

Hiol, M., Kowalski, D., Hiol, A., Jakimchuk, B., Trach, J. An Experimental Study into Flushing of the Flowing Bed Rapid Filter Used in Water Treatment. *Ochrona Srodowiska* 2009, Vol. 31, No. 4, pp. 35–38.

Abstract: In recent times the use of rapid filters with flowing beds (of a density noticeably lower than that of the water) has become increasingly frequent in water treatment processes. Flushing is an important part of a filtration cycle which involves a flowing bed. Flushing with water alone should be performed at a flow rate of $60\text{--}80\text{ dm}^3/\text{m}^2\text{s}$. Delivering such a large water volume requires large-diameter pipes and high-capacity pumps, which severely limits the practical use of flowing bed filters. In this paper a solution to the problem in question has been proposed, which consists in flushing the flowing bed with a stream of water and air. Investigations performed both under laboratory and industrial conditions have shown that flushing can be conducted efficiently at a water flow rate of $2\text{--}5\text{ dm}^3/\text{m}^2\text{s}$, an air flow rate of $10\text{--}12\text{ dm}^3/\text{m}^2\text{s}$, and a flushing time of 800 to 1200 s. In the paper an example has been adduced of filters with flowing beds of a capacity amounting to $12,000\text{ m}^3/\text{d}$. The filters are used in the treatment of water for industrial purposes and have replaced conventional sand filters. Several years' observations have revealed that the investigated flowing bed filters meet the requirements of an efficient water treatment, and that their implementation resulted in essential savings of water and energy.

Keywords: Water treatment, rapid filtration, flowing bed, backwashing, flushing.