

## PROJEKTSTECKBRIEF

Title	MIKROPELLETS - Investigation of processes for integrated micropollutant elimination with aerobic granular sludge – Phase 1
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The project "MIKROPELLETS - Investigation of processes for integrated micropollutant elimination with aerobic granular sludge" aims to integrate micropollutant removal into innovative granular sludge technology in order to improve the condition of water bodies in North Rhineland-Westphalia. The main focus of phase 1 will be placed on the development, implementation and optimization of innovative, patent-free aerobic granular sludge processes in a Sequencing Batch Reactor (SBR) as well as in a continuous flow process. The aim is to gather previous knowledge on aerobic granular sludge and to investigate the operational stability and efficiency for municipal wastewater.

Due to aerobic, easily sedimentable biomass, aerobic granular sludge processes can achieve high conversion rates per volume, even with municipal wastewater. In addition, various biological processes, such as nitrification and denitrification, can take place simultaneously in the different functional layers of the granules. This allows smaller reactors to be realized with the same treatment capacity. In addition, energy-intensive system components such as recirculation are no longer required. Important advantages

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of the aerobic granular sludge technology compared to the conventional activated sludge process are therefore:

- Energy saving
- Cost reduction
- Space optimization

The knowledge obtained will be used to develop practical recommendations for this novel process in terms of operation, design and construction. These recommendations then will be made available to the urban water sector.

In the first phase of the project, ISA will develop a reactor design for an aerobic granular sludge reactor using the SBR process. The reactor will then be built and operated for at least one year at the HTK Neuss. The operation will be intensively accompanied by various analytics, such as wastewater-typical standard analyses and photographic monitoring of the granular sizes. In addition, the resistance of the granules is tested in activity tests, including various parameters like temperature fluctuations, xenobiotics and industrial chemicals.

In a planned second project phase, micropollutant removal processes will be integrated into the investigated aerobic granular sludge technology. The partners' experience in the field of micropollutant elimination using ozone or powdered activated carbon will be incorporated into the project.