

Recovery and utilisation of nutrients for low impact fertiliser



Technology fact sheet – UASB reactor

UASB reactor – Efficient recovery of biogas from concentrated domestic wastewaters

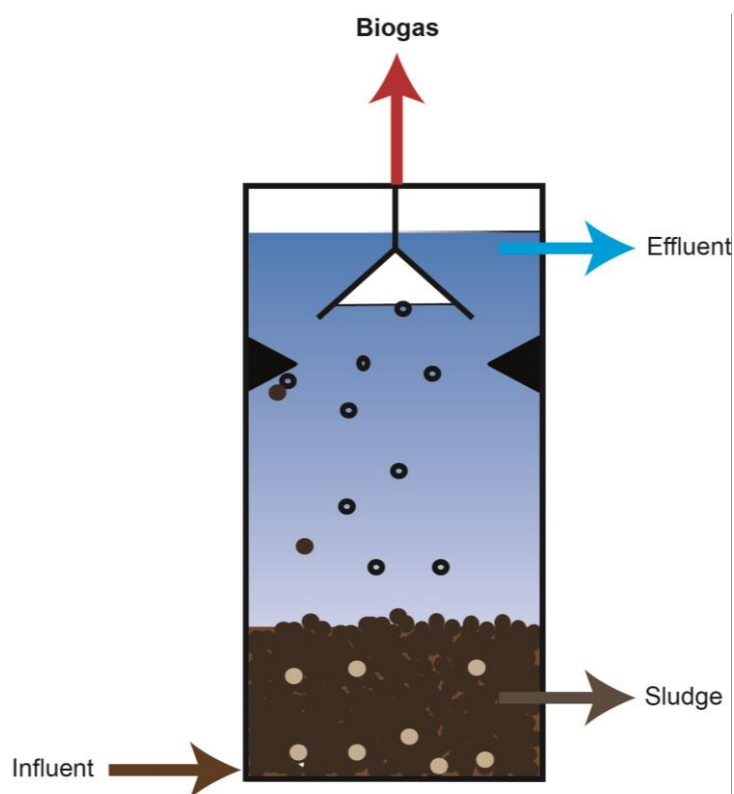
In an Upflow Anaerobic Sludge Blanket (UASB) reactor concentrated black water (BW) and/or grinded organic kitchen waste (KW) enters the bottom of the reactor by an inlet distribution system and flows upwards through a sludge bed. While passing through the sludge bed, the soluble organic substances are converted to biogas, consisting of mainly methane (CH_4) and carbon dioxide (CO_2). Entrapped biodegradable organic solids are hydrolysed and then further converted to biogas as well. In the upper part of the UASB reactor the liquid effluent, sludge and biogas are separated. Bioenergy as heat and electricity can be harvested from the biogas while most of the nitrogen and phosphorous compounds are conserved and liberated in the reactor effluent, wherein they are present as ammonia and phosphate. That way, they are available in soluble form for subsequent recovery via technologies such as struvite precipitation, ammonia stripping or bio-electrochemical systems. The produced sludge is dewatered, and depending on local legislation it is transported to an incineration plant or used directly as an organic fertilizer after disinfection.

Key facts

- Suitable for processing highly concentrated wastewaters
- Biogas production
- Liberate nutrients (ammonia and phosphorus) in soluble form for subsequent recovery
- Production of liquid and solid fraction (effluent and sludge)
- Relatively low sludge production

Application in Run4Life demo sites

- Input: BW, KW, BW + KW
- Output: biogas, sludge, liquid effluent
- Applied in Helsingborg, Ghent and Sneek.



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