

ULTRAWAVES ULTRASOUND SYSTEM FOR IMPROVEMENT OF ANAEROBIC DIGESTION ON WASTE WATER TREATMENT PLANTS

Bargteheide WWTP, Germany



I. Specification of the plant

Design capacity	42,500 PE
Actual loading	37,500 PE
Sludge treatment	<ul style="list-style-type: none"> • Primary Sludge: ~44 m³/d • Thickened waste activated sludge: ~18 m³/d • Co-Fermentate: ~12 m³/d (from honey production)
Separate waste activated sludge thickening	<ul style="list-style-type: none"> • Belt-type filter
Anaerobic sludge stabilization	<ul style="list-style-type: none"> • 2 digesters (parallel à 900 m³, mesophilic) • HRT: 20 days
Biogas production	<ul style="list-style-type: none"> • 1.200 Nm³/d Biogas • 77% of the CHP capacity used
Digested sludge dewatering	<ul style="list-style-type: none"> • 2 centrifuges
Sludge disposal	<ul style="list-style-type: none"> • Incineration

II. Objective of the ultrasound application

- Intensification of anaerobic digestion process
- Increase of biogas production
- Reduction of the residual sludge
- Improvement of the dewaterability

III. Installation of the Ultrawaves ultrasound system

- Full-scale test phase of three and a half months (June 2012- September 2012), permanent since September 2013
- Total TWAS flow was treated 24 h/d with one ultrasound system unit à 5 kW (Figure 1)

IV. Results

- Increase of the degradation degree of 14,5% and due to this an improvement of the biogas production (see Figure 2)
- Increase of the total volatile solids (VS) degradation of 20%
- Improvement of the dewaterability of 5% (see Figure 3)
- Decrease in sludge disposal costs
- Decrease of the demand of flocculation aids
- Decrease of the sludge viscosity

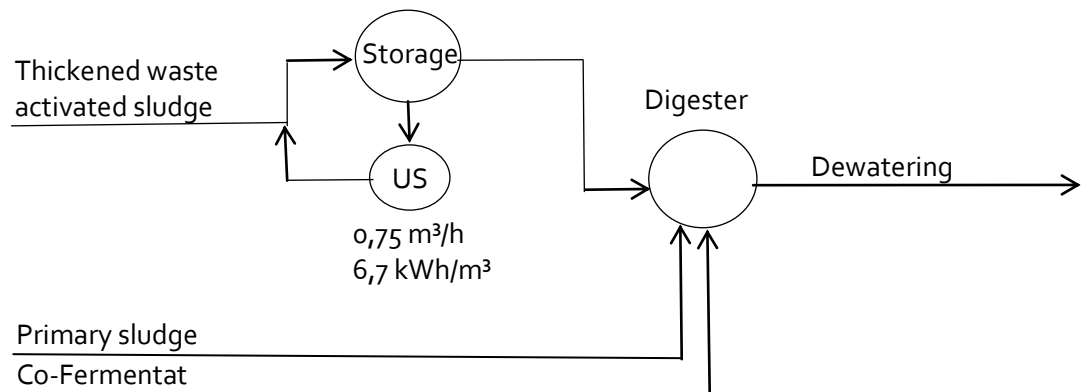


Figure 1: Implementation of US in the process

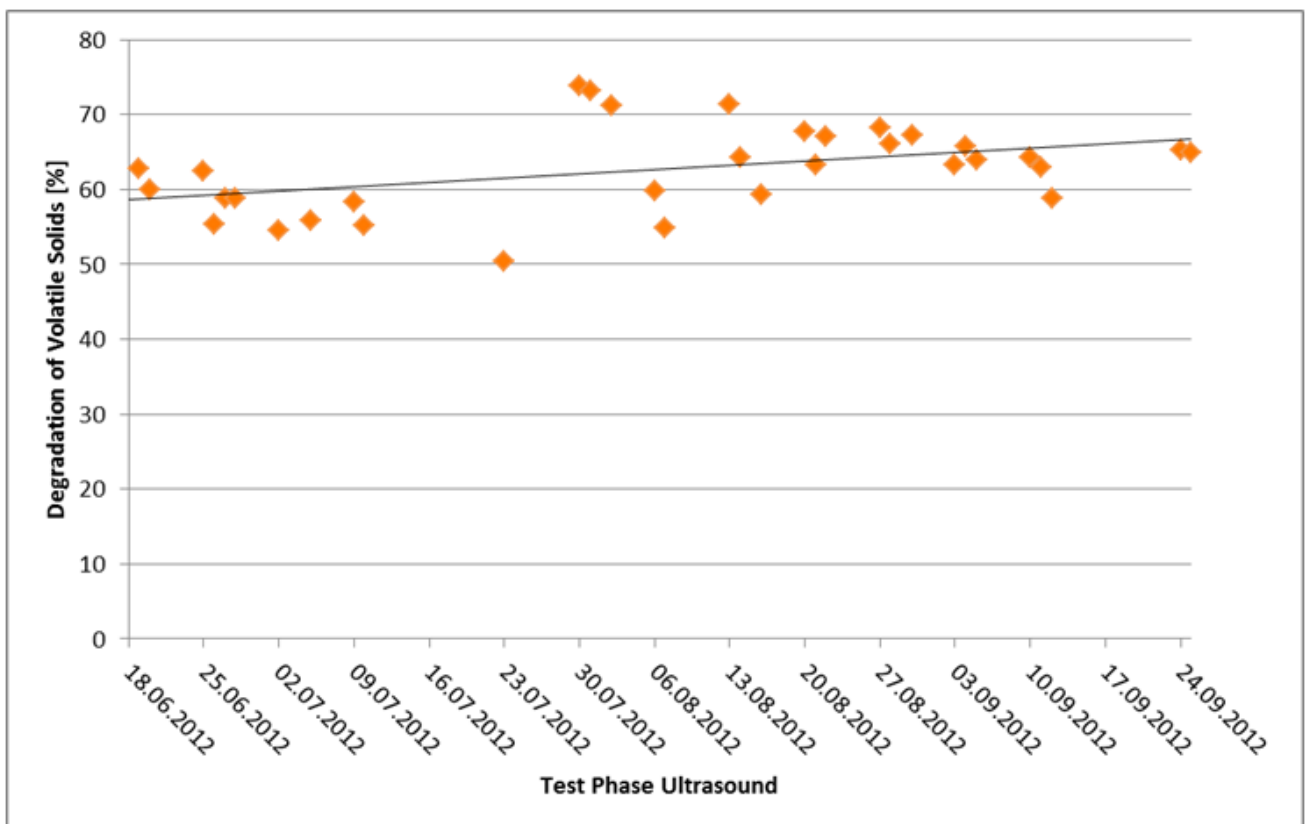


Figure 2: Degree of degradation during test phase

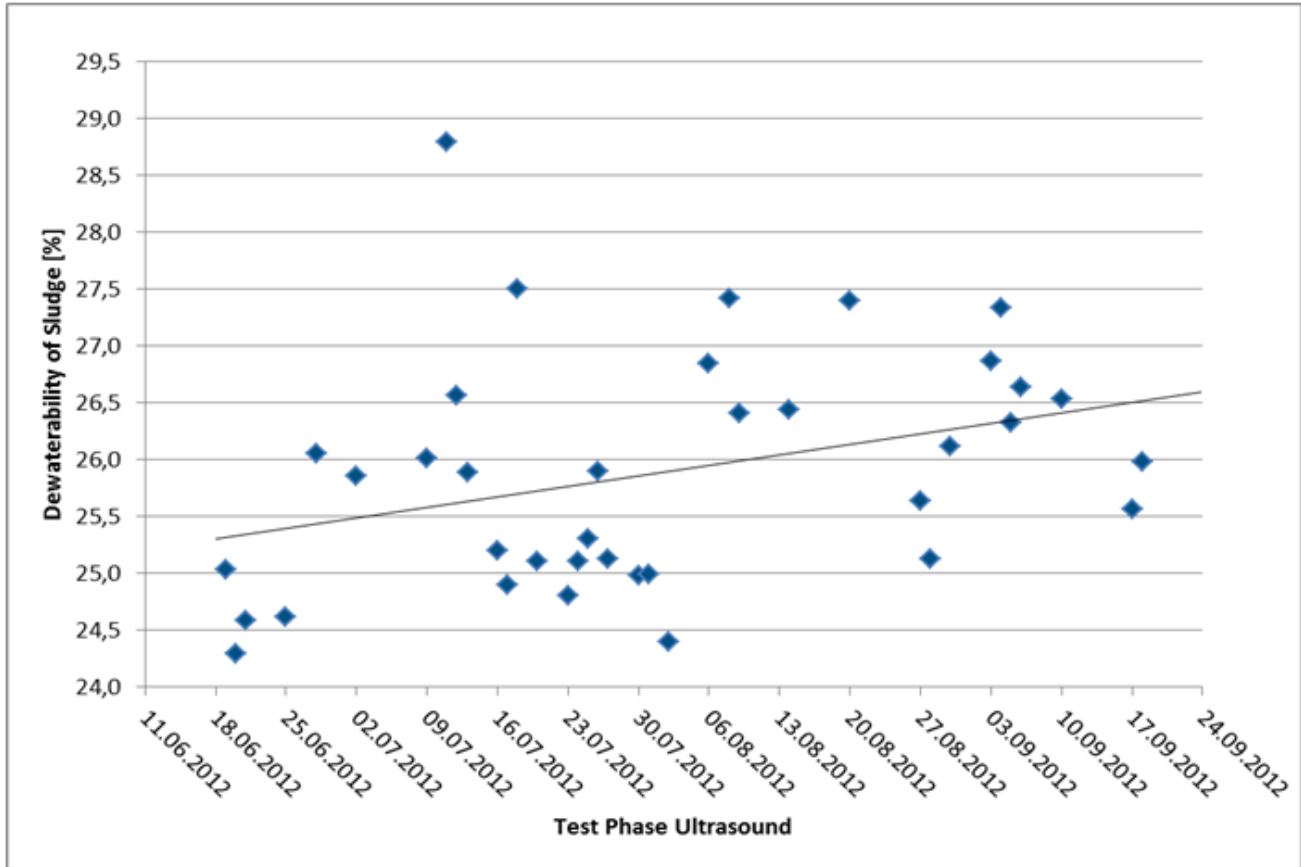


Figure 3: Degree of dewatering



Figure 4: Ultrasound technique at Bargteheide WWTP, winner of the German Energy-Olympics 2013

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