

# 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> <li>Primary Sludge: ~44 m³/d</li> <li>Thickened waste activated sludge: ~18 m³/d</li> <li>Co-Fermentate: ~12 m³/d (from honey production)</li> </ul>
Separate waste activated sludge thickening	Belt-type filter
Anaerobic sludge stabilization	<ul> <li>2 digesters (parallel à 900 m³, mesophilic)</li> <li>HRT: 20 days</li> </ul>
Biogas production	<ul> <li>1.200 Nm³/d Biogas</li> <li>77% of the CHP capacity used</li> </ul>
Digested sludge dewatering	• 2 centrifuges
Sludge disposal	<ul> <li>Incineration</li> </ul>

### 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

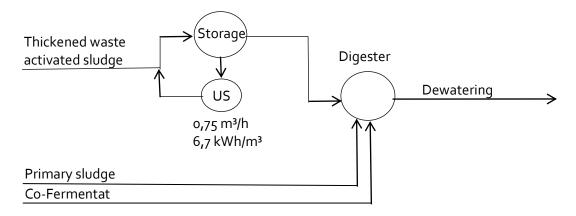


Figure 1: Implementation of US in the process

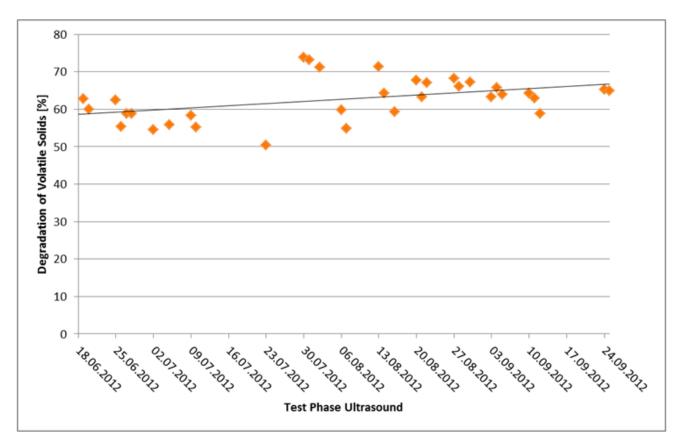


Figure 2: Degree of degradation during test phase



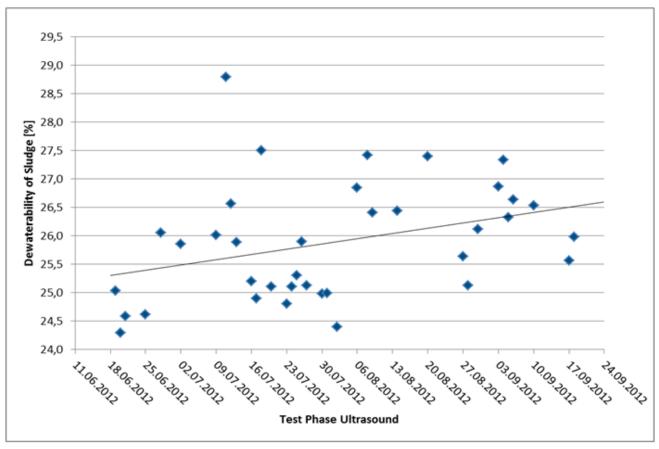


Figure 3: Degree of dewatering



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

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