

# Combatting of foaming sludge in digester by ultrasound technology

Meldorf WWTP, Germany



## I. Brief snapshot of the plant

- **Design capacity**  
72.000 PE
- **Actual loading**  
40.000 PE
- **Biological waste water treatment**  
P-Elimination  
  
Intermittent denitrification  
(regulated by Auqualogic, Passavant Intec)  
  
Secondary clarification  
  
Downstream P-precipitation ( $\text{Fe}^{3+}$ )  
  
Filtration
- **Sludge treatment**  
No primary sludge  
Thickened waste activated sludge  
Co-Fermentate
- **Waste activated sludge thickening**  
Disc concentrator (Huber)
- **Anaerobic sludge stabilisation**  
1 digester 2.000m<sup>3</sup>, mesophilic  
2 digester 2.000m<sup>3</sup> (used mainly as storage tank)  
HRT: 22 days
- **Degradation rate volatile solids (VS)**  
61% as per cent of dry solids before test phase
- **Digested sludge dewatering**  
Chamber filter press
- **Sludge disposal**  
Agriculture

## II. Objective of the ultrasound sludge disintegration

- Combat foaming sludge in the digester by destroying filamentous microorganisms (Microthrix parvicella)
- Fail-free digester performance and trouble-free biogas utilization
- Increase volatile solids degradation

## III. Preliminary trial of the ultrasound disintegration system

- Test phase of three months (September - November 2004)
- Total TWAS flow was treated with 1 ULTRAWAVES US unit à 5 kW (Fig. 1)

## IV. Results of the trial

- Combat foaming sludge in digester  
Foaming was stopped shortly after implementation of the ultrasound system
- Fail-free performance and trouble-free biogas utilization  
Continuous addition of co-fermentate is possible  
Trouble-free utilization of increased biogas production
- Volatile solids degradation  
Reduction of the volatile solids from 61% to 45% (Figure 2)

## V. Payback time

Based on these results, the payback time for the ultrasound system installation is calculated with 3 years.

## VI. Full-scale Installation

Since May 2005 the ULTRAWAVES ultrasonic system is implemented. And since is in operation 24 hours per day.

## Contact:

Ultrawaves Wasser & Umwelttechnologien  
Kasernenstraße 12  
21073 Hamburg  
Telefon: +49 (0)40 325 07 203  
[www.ultrawaves.de](http://www.ultrawaves.de)

Abwasserbeseitigung der Stadt Meldorf  
Abwassermeister Waldemar Herzberg  
Siebenbrückenweg  
25704 Meldorf  
Tel.: +49 (0)4832 55063  
E-Mail: [klaeranlage-meldorf@wv-suederdithmarschen.de](mailto:klaeranlage-meldorf@wv-suederdithmarschen.de)

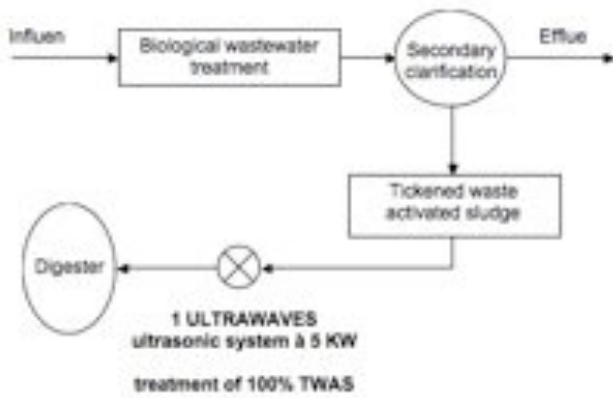


Fig. 1: Implementation of US in the process

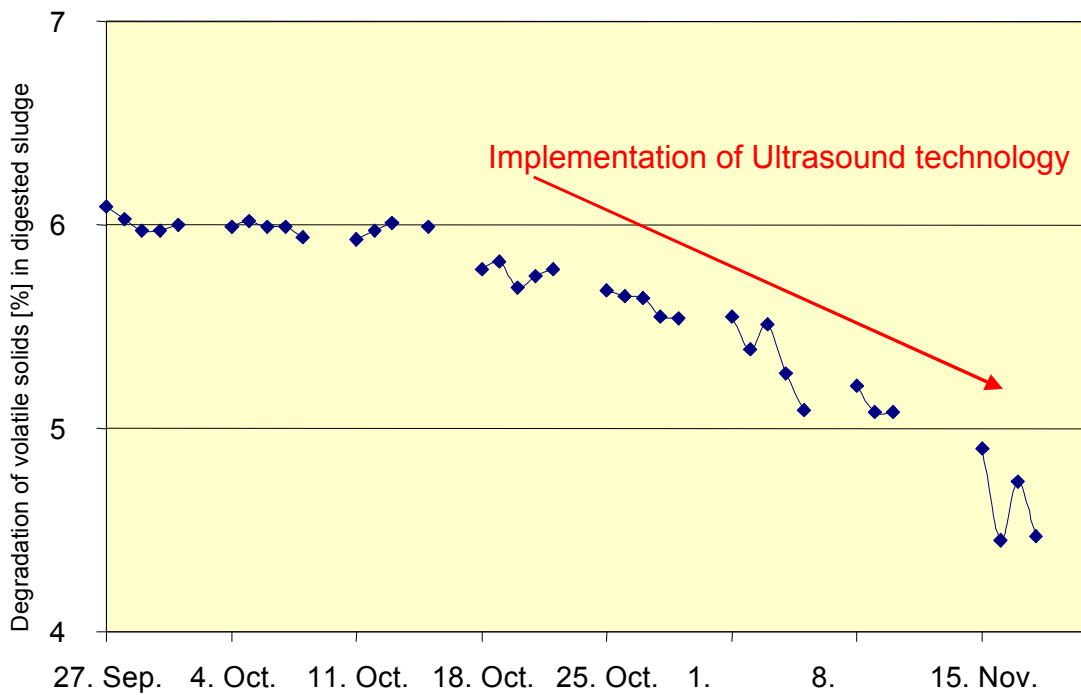


Fig. 2: Reduction of volatile solids since implementation of Ultrasound technology