Ultrasound Sludge Disintegration for Anaerobic Digestion Acceleration and Enhancement

Bamberg WWTP, Germany

I. Brief Snapshot of the Plant

- Design Capacity:
  - 230,000 PE (~ 12.15 MGD)

- Actual Loading:
  - 280,000 PE (~ 14.79 MGD)
  - Overloading conditions

- Sludge Feed:
  - Primary and thickened waste activated sludge (TWAS)

- Facilities:
  - Three mesophilic anaerobic digester tanks (2 x 2,000 m³, 1 x 3,000 m³)

- Detention Time:
  - 18 day HRT

- Sludge Disposal / Final Use:
  - Incineration after dewatering of the digested sludge

II. Initial Plan for the Anaerobic Digestion Facilities Upgrade.

Construction of a brand new 3,000 m³ digester in order to increase HRT from 18 d to 25 d.

III. The Trial of the Ultrasound Disintegration System.

The plant decided to use the EIMCO / Ultrawaves innovative Ultrasound reactor for sewage sludge cell disintegration in order to speed-up anaerobic sewage sludge digestion
and to eliminate the need for the construction of a new digester as follows:

- Four Months Test (May – August 2002) with Treatment of 30% of total TWAS flow

### IV. The Results and Benefits of Using Ultrasound.

- Volatile Solids destruction:
  - Improved from 42% to 54%.
- Digested sludge VS:
  - Reduced from 60 % (as % of TS) to 54%.
- Biogas production:
  - 30% increase
- Payback time:
  - 2 years

![Current Bamberg WWTP Sludge Flow Sheet](image)

✓ Avoided the Construction of a New Anaerobic Digester!
✓ Savings of 3.3 Million Dollars in Capital Equipment
✓ Full-Scale Installation since May 2004

![Graphs showing biogas production and VS destruction](image)

### V. Contact

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