FUCHS ATAD
from sewage sludge to Class A Biosolids

Air

Water

Biosolids

Clean Solutions
FUCHS ATAD Process
How to make Class A Biosolids

FUCHS ATAD Process:
The economical and reliable way from sewage sludge and manure to Class A Biosolids

Nowadays, we recognize sewage sludge and manure as highly valuable resources. They provide for various nutrients and soil-improving organic components.

Returning sludge and manure into the natural cycle provides not only ecological, but also economical benefits.

Autothermal Thermophilic Aerobic Digestion (ATAD) is a process for effective stabilization and disinfection.

ATAD turns sewage sludge into Class A Biosolids – permitting their beneficial reuse to the best advantage of nature.
**Fundamentals**

Digestion is the biological degradation of organic solids. Natural aerobic digestion processes release energy – mainly in the form of heat.

The ATAD technology takes advantage of thermophilic aerobic microorganisms (> 50 °C/122 °F) which, due to their rapid growth, overwhelm other bacteria. The FUCHS ATAD Process provides them an ideal environment.

Pathogens, however, are inactivated and killed. Final products of thermophilic digestion are low-energy components such as water and carbon dioxide.

**Benefits**

- Simultaneous stabilization and disinfection
- Meets or exceeds international biosolids standards
- Approved process technology
- Short retention time (9 days)
- Small footprint
- Low investment costs
- Excellent process stability and reliability
- Flexible operation
- Easy extension of capacity
- Many municipal and industrial reference installations worldwide
- Over 35 years of experience

**FUCHS Equipment**

ATAD systems depend on sturdy and reliable aeration and foam control equipment. FUCHS Spiral Aerator and FUCHS CENTROX Aerators are designed especially for the use in ATAD reactors. They have proven their performance and reliability over many years. They do not have submerged bearings or seals and all submerged components are made of stainless steel or plastics.

Aeration of sludge generates foam so that dense foam layers build up rapidly on the surface. Such foam layers improve oxygen transfer and thus beneficially contribute to the process performance, but their height must be kept under control. Effective foam control is an essential element of ATAD technology.

FUCHS Foam Controllers permit utilizing the advantages of a constant foam layer – without jeopardizing operation of the process.
FUCHS ATAD Process – an excellent treatment for liquid manure as well as virtually all kinds of sewage sludge. It is designed to operate in a flexible two-stage batch mode. For over 35 years our flexible two-stage mode of operation has proven superior performance and process stability.

FUCHS ATAD AIC™ (Advanced Integrated Concept) makes the FUCHS ATAD Process even more powerful. We achieve this by integrating an advanced ATAD design into a new overall concept, comprising a configuration with new and superior process equipment in the whole biosolids treatment line.

Results of FUCHS ATAD AIC™ are a better heat balance and higher oxygen supply in the first stage, odor-free operation and remarkably enhanced dewatering. This raises the FUCHS ATAD Process to the next level - to the benefit of our customers.

Temperatures providing for reliable disinfection
Powerful digestion by enhanced reactor design

Another advantage is the higher air supply in the first stage, providing oxygen when it is needed. While some single-stage designs of other suppliers suffer from unjustifiably long retention times, our FUCHS ATAD AIC™ systems perform well at retention times as short as ~ 9 days.

The combination of all these improvements provided by the FUCHS ATAD AIC™ concept make ATAD even more efficient and dependable.

The Advanced Integrated Concept

Feed sludge is thickened without addition of polymers. Not only polymer costs are saved, but also dewaterability of the digested biosolids is significantly improved.

Exhaust gas from the ATAD reactors is treated by Photo-Catalytic Oxidation (PCO), a reliable and virtually maintenance-free technology for odor control.

FUCHS ATAD AIC™ concept also includes a first reactor bigger than the second reactor. Using two stages different in size improves the energy balance of the ATAD process. The sludge in the larger first reactor heats up faster and to a higher temperature.

Another advantage is the higher air supply in the first stage, providing oxygen when it is needed.

Class A Biosolids
A product that impresses

Photo-Catalytic Oxidation
clean air guaranteed
When classic FUCHS ATAD design with circular reactor tanks reaches its limit, ATAD in large scale (ATAD LS) is a full-fledged alternative for high-capacity applications. In ATAD large-scale design, the process takes place in rectangular, covered concrete tanks. Just as „classic“ FUCHS ATAD, ATAD LS plants handle virtually every kind of sludge, like waste activated sludge or primary sludge from municipal or industrial sources – and that at minimal cost!

**Benefits**

- High-quality Class A Biosolids with excellent fertilizing capabilities
- High-capacity solution at low operational/investment costs
- Treatment of virtually all kinds of sludge
- Retention time of ~ 9 days
- Small footprint and excellent utilization of available space
- Reuse of existing tanks possible
- High energy efficiency

**FUCHS Equipment**

The heart of each FUCHS ATAD LS plant are the aerators. FUCHS Aerators combine high energy efficiency with sturdy design minimizing maintenance. The unique CENTROX Aerator with Foam Control ensures agitation, mixing and fine-bubble aeration of the sewage sludge. Especially designed for being used in the ATAD environment the CENTROX Aerator features a special foam cone, enabling the machine also to limit the height of the foam layer on top of the sludge.
Why only municipal sludge?

ATAD applications for industrial waste

Nearly all existing ATAD plants treat municipal sewage sludge. Trials with FUCHS pilot plants proved that the ATAD process is also applicable for industrial wastewater sludge. In particular sludge from the food processing industry can well be treated in ATAD systems; the sludge contains no significant heavy metals and other contaminants and can be used for land application, fertilizing and soil improvement.

The organic sludge is easily degradable and heats up autothermally to disinfecting temperatures. We have performed successful pilot tests with sludges from dairies, potato and pet food processing. Our pilot plants are equipped with self-aspirating aerators, foam controllers and integrated heat exchangers which control the reactor temperature. We offer pilot plants for rental and operation by the customer, or alternatively, to perform entire pilot tests with FUCHS personnel on-site. After pilot testing we have successfully designed and built full-scale ATAD systems for a dairy, a potato processing factory and a paper mill.
The Applications

- Municipal Wastewater
- Industrial Wastewater
- Activated Sludge Plants
- Aerated Lagoons
- Nitrification / Denitrification
- Aeration of Rivers and Lakes
- Balance and Equalization Tanks
- Neutralization of Alkaline Wastewater
- Mine Water Treatment
- Leachate and Landfill Lagoons
- Biosolids Treatment
- ATAD process (Autothermal Thermophilic Aerobic Digestion)
- ATAD AICTM (Advanced Integrated Concept)
- Odour Control

The Equipment

Aerators
- Spiral Aerator
- OXYSTAR Aerator
- CENTROX Aerator
- CENTROX Aerator with foam control
- AEROSTAR Aerator

High Speed Mixers
- TURBOSTAR Mixer
- Submerged TURBOSTAR Mixer

ATAD Equipment
- Spiral Aerator
- CENTROX Aerator
- Foam Controller

Biofilters for Odour Control
- with integrated pre-scrubber
- with separate pre-scrubber