



MesoAer™

Take Control with MesoAer™ !

- MesoAer - F** Conventional aerobic digestion today → ThermAer™ tomorrow
- MesoAer - A** Following Anaerobic process
- MesoAer - C** Conventional aerobic/mesophilic digestion
- MesoAer - T** Following ThermAer™ process

MesoAer offers a consistent, year-round solution to the growing challenge of solids handling and processing. MesoAer was developed and designed with the specific intent of transferring oxygen in high solids applications. This process is capable of meeting the aeration demands, as well as providing a cost effective process for substantial volume reduction and odor-free stabilized biosolids.

Regardless of the digestion process, there is a MesoAer perfectly suited for the job.

MesoAer provides optimum temperature, pH, alkalinity and aeration conditions for nitrification and denitrification. This single reactor is operated just under 100°F, a temperature ideal for the optimal growth of nitrifying and denitrifying bacteria. pH set points are used to control the nitrogen cycle by creating aerobic or anoxic conditions, while naturally occurring mesophilic organisms contribute to the breakdown and consumption of organic matter yielding a consistent biosolid product year round.

MesoAer offers the following advantages:

Lower nutrient recycle

Nitrification and denitrification in the MesoAer greatly reduce the ammonium concentration in the recycle streams. On average, ammonium concentrations are reduced by over 75%.

Lower disposal costs

- **Additional VS and TS reduction**

The mesophilic aerobic conditions of the reactor allow for the activity of a large culture of organisms not engaged during preceding processes. VSR ranges from 20 to 50%.

- **Drier cake post dewatering**

Highly water retentive exopolymeric substances (EPS) are reduced in conjunction with additional VSR allow for drier cake off dewatering equipment.

Odor reduction

Sulfur compounds and mercaptans generated during the anaerobic process are oxidized in the aerobic conditions of the MesoAer.

SAVES MONEY

Advantages listed above all contribute to direct financial savings.

- Fewer solids equates to less polymer consumption and less energy and manpower required to operate dewatering equipment. A drier cake lessens the weight and volume to be stored, transported and managed.
- The MesoAer can often be retrofitted into virtually any tank configuration. This offers capital cost savings by employing existing tankage.
- Lower energy consumption compared to other high VS. destruction, aerobic digestion processes.
- Nitrification and denitrification is carried out in a single tank.
- Full automation - the system can be operated with minimal operator input.

FOLLOWING THERMAER

The ThermAer process has been quickly gaining popularity with its many process advantages such as yielding Class A biosolids, odor free operation, small footprint and energy efficiency (Green Credit). The high VSR - typically over 65% - creates a high pH environment laden with ammonia. Much like the post anaerobic digestion application, the MesoAer-T will lower nutrient recycle and condition the biosolids.

First generation ATAD biosolids, although Class A, were strongly criticized for being very difficult and expensive to dewater. The inclusion of the MesoAer-T post ATAD, or ThermAer, resolved this issue.

OPERATIONS

"Before we installed the MesoAer-T after our ThermAer system we experienced numerous violations in effluent ammonia, turbidity and suspended solids. The MesoAer tank lowered the ammonia levels in our dewatered biosolids, resulting in improved plant effluent ammonia, turbidity and suspended solids. The dewatered cake has no odors."

Dave Gromm, Director of Wastewater Collections and Plant Operations, Calera Creek Water Recycling Plant, Pacifica, California

"Thermal Process Systems' MesoAer-T provided the Delphos WWTP with the flexibility to dewater when necessary according to our loadings. Controlling the aeration in this reactor allows us to nitrify and denitrify, reducing polymer consumption and improving dewaterability. In addition, we see approximately an additional 10% TS destruction across the MesoAer-T which means less biosolids cake to land apply and increased capacity in our solids storage building."

Kim Riddell, former Wastewater Superintendent, Delphos Wastewater Treatment Plant, Delphos, Ohio



"We've always credited the conditioning that the biosolids receive in the MesoAer-T as the reason we have excellent decanting ability in our long term storage tanks. This has allowed us to thicken our biosolids without the cost of chemicals and has cut our land application hauling almost in half."

Scott Truedson
Assistant Superintendent
Marshall Wastewater Facility
Marshall, Minnesota



FOLLOWING ANAEROBIC DIGESTION

The production of methane gas makes anaerobic digestion a popular choice for many high volume wastewater treatment facilities. Drawbacks often include high ammonia concentration in the filtrate/centrate, corrosivity and odor production. These challenges are expensive to manage and consume valuable man hours. MesoAer-A can fix it.

As with any digestion process, ammonia is released. Without treating this high ammonia concentration in the solids, it moves through the process to the filtrate/centrate where it must be carefully reintroduced to the front of plant, placing an unnecessary tax on the aeration system and wasting energy.



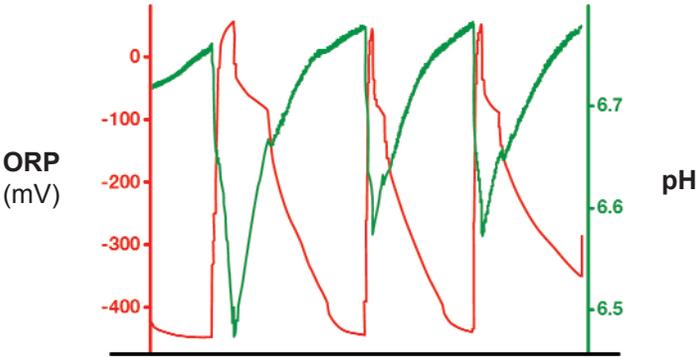
"The MesoAer-A system practically operates itself. Additionally, there are so many other minor benefits that were realized after we installed the process, it's amazing no one has come up with this before. Kudos to TPS for doing it right the first time."

Norman C. Berry Jr.
Superintendent
Town of Speedway
WWTP

REAL OPERATIONAL DATA & COST SAVINGS

Speedway, Indiana

- Ammonia reduction of 97% in the filtrate - they are no longer exceeding final permit conditions
- 33% decrease in the consumption of polymer
- Additional VSR averaging over 30%
- Oxidation of odorous and corrosive sulfur compounds
- Reduced tipping and disposal costs by 30%



Typical variation of ORP and pH in the TPS MesoAer™



CONVENTIONAL AEROBIC DIGESTION/FUTURE UPGRADE TO THERMAER

MesoAer design is based upon the concentration of biological solids and nitrification/denitrification requirements. Mixing is achieved by a jet mixing pump and is controlled by a VFDs, to vary the speed based upon the control parameters within the digester. This provides shear and results in efficient oxygen transfer while conserving energy. MesoAer is quite unique and can process up to 4% TS, depending on temperature, viscosity, VS and HRT.

OPERATIONAL ADVANTAGES

- Consistent control and performance year round
- Ability to process high solids concentrations
- Exceptional oxygen transfer
- 40 -50% volatile solids reduction
- MesoAer-F specifically designed to easily and economically upgrade to the Class A ThermAer process
- Energy efficient due to the high level of automation and process control
- Ability to retrofit existing tankage
- Possibility of increasing treatment capacity

The **experience** to know what works.

The **innovation** to make it work better.

Thermal Process Systems was founded by experienced wastewater treatment professionals who understand the complex issues of biosolids processing and re-use. Hindered by the compromises that were necessary with existing systems – and the inability of these processes to meet industry demand – they formed their own company focused exclusively on biosolids management. The result is the proprietary ThermAer process. ThermAer has been subjected to rigorous field testing in full-scale operating systems and pilot testing at various sites since 1995. It has exceeded every customer expectation.

Contact us today for a no obligation analysis
of your biosolids management needs.



Thermal Process Systems
627 E. 110th Ave.
Crown Point, IN 46307 USA

Phone: (219) 663-1034
Fax: (219) 663-7248

E-Mail: engineering@thermalprocess.com
www.thermalprocess.com