

Create “Class A” Biosolids

Application of Monsal* 70 System Biosolids Treatment



Figure 1: GE's Re:Heat* heat recirculation system

Introduction

An ongoing issue for wastewater treatment plant owners and operators is managing sludge and biosolids. Biosolids management often is a major contributor to overall plant operating costs – costs which continue to escalate as ways to dispose biosolids become increasingly limited.

Land application of biosolids dominates globally as the solution, but due to concerns over the transfer of pathogens, contaminants and toxins to crops and species which come in contact with the soils, the application of biosolids is restricted without proper treatment. These restrictions are mitigated when biosolids undergo recognized treatments to reduce or eliminate pathogen levels.

In the United States, the Environmental Protection Agency (EPA) governs biosolids under the Part 503 rule. Biosolids which are recognized to have gone through an accredited process, defined in 40 CFR Part 503 for pathogen reduction are deemed to be “Class A.” GE uses a patented pasteurization process which is recognized under this rule, as an acceptable treatment process to produce “Class A” biosolids.

Critical to Quality

- EPA compliant for Class A biosolids
- Eliminates restrictions of biosolids utilization
- Long term certainty for biosolids planning
- Add-on solution to existing Anaerobic Digestion (AD) plants
- Maximum “in-process” heat recovery
- No supplementary fuel required
- Integrated with either plant boilers or CHP
- Continuous flow
- Compact footprint
- Automated operation with batch verification
- Optimized energy balance - Lower overall temperature compared to other technologies
- Economical solution to Class A Biosolids
- Low total operating cost

Monsal 70 System Process

- Sludge feed transfer
- Re:Cover*; Heat Recovery
- Re:Heat; Heat Recirculation
- Pasteurization Holding Tanks
- Batch verification
- Sludge discharge pumping



Creating Pathogen Free Biosolids

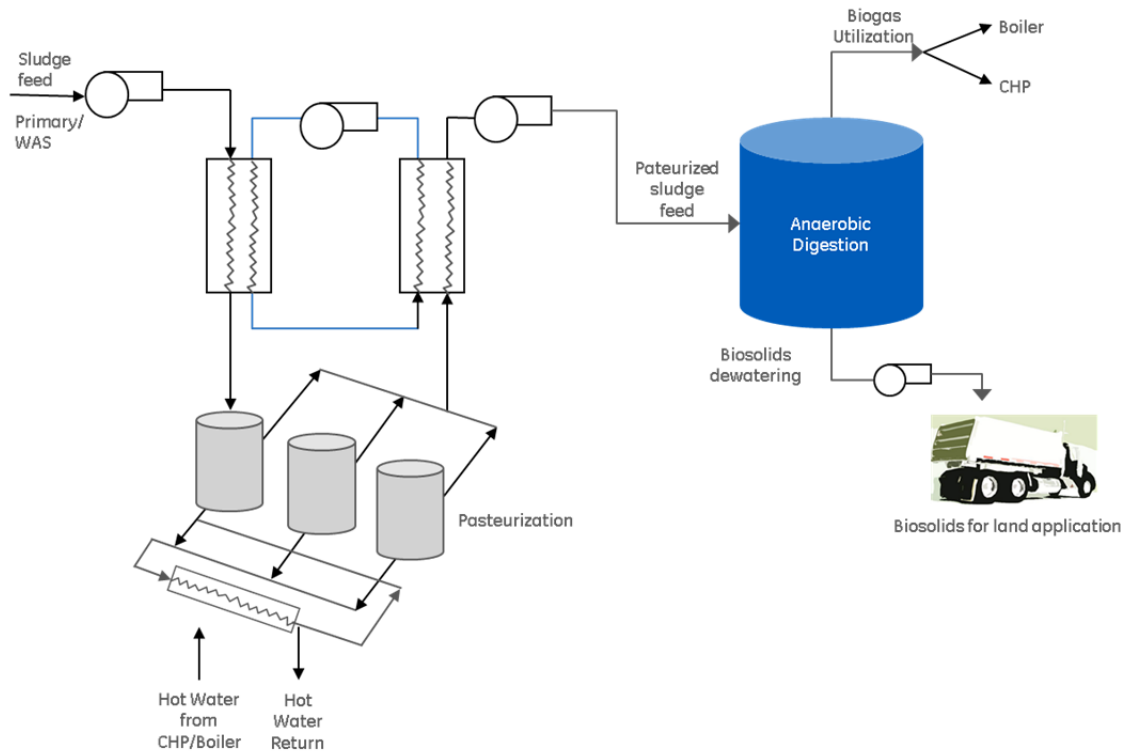


Figure 2: GE's Class A Biosolids process

EPA Compliant for Class A Biosolids

The Monsal 70 process utilizes pasteurization of sludge at a hold temperature of 70°C for 60 minutes. This is in line with the EPA Part 503 rule which recognizes pasteurization as an approved process to Further Reduce Pathogens (PFRPs), which when used results in Class A Biosolids.

Eliminates Restrictions of Biosolids Use

Sludge treated with the Monsal 70 system, combined with anaerobic digestion, results in a Class-A biosolid. With this classification, no land application restrictions exist, which provides plant owners long term certainty of biosolids disposition. Biosolids can be freely applied, regardless of crop type, or land use including turf and public access.

Long Term Biosolids Planning Certainty

With uncertainty surrounding land use regulations and disposal options for organics, employing a GE Monsal 70 system allows plant owners and operators to have long term options for biosolids management.

Add-on Solution to Existing AD Plants

GE's Monsal 70 can be added to any existing digestion plant with minimal integration costs or extensive retrofits. It is designed to be plug and play at the front of any AD plant, with all controls defined. The system can even be commissioned in place without taking downstream digestion out of service.

Maximum "In-Process" Heat Recovery

Every batch leaving the process serves as a pre-heater for the incoming batch. Through GE's Re:Cover heat recovery, thermal energy from the outgoing sludge is transferred via a hot water loop to the incoming sludge. This effectively pre-heats the sludge and reduces the outgoing sludge temperature to the downstream digestion for easy integration.

No Supplementary Fuel Required

Since the Monsal 70 process is a pre-treatment to digestion, the thermal energy used in the pasteurization process is carried through to anaerobic digestion. Combined with effective in-process heat recovery, the overall thermal demand of an AD plant is kept to a minimum.

Integrated with Plant Boilers or CHP

The Monsal 70 system can use the existing plant heat sources for all thermal energy within the process. Thermal energy can be drawn from existing boilers or combined heat and power units (CHP), such as GE's range of Jenbacher CHP engines, using plant biogas. GE can work with you to optimize the recovery of heat from available sources.

Continuous Flow

Although the pasteurization process is a batch operation, the employment of three (3) pasteurization tanks in parallel allows for the overall plant flow to be continuous, thus maintaining a stable heat demand for ease of process control and integration with existing systems. This allows for full adaptation to any existing digester feeding regiment.

Compact Footprint

Available in multiple standard capacities, with varying tank heights, the Monsal 70 system is very compact and can fit within a 35' x 55' (10.5m x 16.8m) footprint. With no buried pipes, this system can easily be built and situated with slab on grade construction.

Automated Operation with Batch Verification

The fully automated Monsal 70 system integrates into any existing plant control system. As part of the standard system operation, every batch of sludge which is treated through the Monsal 70 system is verified to have met both the time and temperature conditions. If a batch does not meet the acceptable conditions, it is re-treated. No batch is sent to digestion without verification, and batch records are kept.

Optimized Energy Balance – Lower Overall Temperature Compared to Other Technologies

The process conditions of 70°C, are lower than alternative treatment technologies to produce biosolids compliant with Class A, while still maintaining a reasonable processing time. Combined with GE's innovative heat recovery technology, minimal thermal energy is wasted.

Economical Class A Biosolids Solution

In comparison to other means of achieving Class A biosolids, GE's Monsal 70 solution is an economical solution. No specialized operating permits or staff are required. Using the plant's existing thermal energy, the system does not add any significant heat demand. It is designed to be easily integrated up-front of existing anaerobic digestion and evasive retrofit costs are avoided. To gain the benefit of pasteurization, conditioning of the sludge is not required, so any costs associated with it are avoided.



Figure 3: Biosolids for land application

Low Total Operating Cost

With full system automation, maximum heat recovery and utilization, the overall system operating costs are minimized. Equipment selection is typical of the wastewater industry, and preventative and routine maintenance is limited and familiar to existing plant staff.

Summary

Description	Specification
Standard Capacities	63,400 gpd (240 m3/day)
	95,000 gpd (360 m3/day)
	126,800 gpd (480 m3/day)
	190,000 gpd (960 m3/day)
	*Design to suit available
Pasteurization Batch Conditions	60 Minute Hold at 70°C
EPA Compliance	Class A under CFR 40 Part 503 Rule (Alternative 5: approved PFRP)
Typical Footprint	35' x 55' (10.5m x 16.8m)
Materials of Construction	316SS