BIOSOLIDS

Digelis® BH

Advanced Anaerobic Digestion of municipal sludge with integrated Biological Hydrolysis

Compact design, optimised biogas production and possible sludge hygienisation

- ⇛ **Optimise digestion performances**
- ⇛ **Reduce digestion workshop footprint**
- ⇛ **Produce (US EPA class A) hygienised biosolids**

Two-phase digestion with upstream biological hydrolysis for activated or mixed sludge

Two-phase digestion systems are among the advanced anaerobic digestion solutions that reduce overall volume while maintaining or improving biogas production. In addition, under certain conditions, these systems can also produce hygienised sludge in accordance with US EPA Rule 503 for the production of Class A biosolids.

In SUEZ's range of Anaerobic Digestion (AD) products with biological hydrolysis, two configurations are possible, combining a mesophilic or thermophilic first phase with a mesophilic digestion phase.

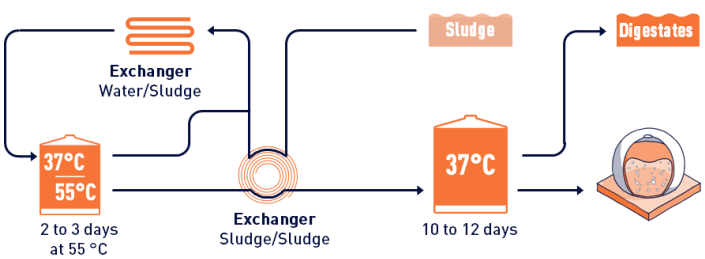
Up to

40%

digestion volume reduction

2 configurations:

- Mesophilic-Mesophilic with Digelis® BH
- Thermophilic-Mesophilic with Digelis® BH_A



The Digelis® BH technology...

Digelis® BH
Acid/Gas phased AD

The Acid/Gas phase system consists of a reactor operating at low pH and short sludge retention time that favours the hydrolysis and acidification phases, followed by another reactor operating close to neutral pH and longer sludge retention time, to meet the growth requirements of methanogens.

The **first phase** (typically with a hydraulic retention time ⩽ 3 days), known as the primary or acid phase digester, consists of hydrolysis and the first acid production stage, in which acidogenic and acetogenic bacteria convert organic matter into soluble compounds and volatile fatty acids.

The **second phase** (typically with a hydraulic retention time ⩾ 12 days), known as the secondary or gas phase digester consists of further conversion of organic matter to acetic acid through acetogenesis, as well as the methane formation step, in which methanogenic archaea convert soluble matter into biogas.

In an Acid/Gas-phased digestion, both steps are operated under mesophilic conditions (37°C).

Digelis® BH_A
Temperature phased AD (TPAD)

An innovative approach to designing a two-phase anaerobic digestion (AD) system involves separating the stages temporally by introducing different temperature levels at various points in the process. This method is known as temperature-phased anaerobic digestion, or TPAD. In this configuration, hydrolysis and acidogenesis are optimized by raising the operating temperature to 55°C or higher, with a hydraulic retention time of at least 2.1 days.

TPAD combines the benefits of thermophilic digestion, such as rapid digestion kinetics, while mitigating its drawbacks, like high concentrations of colloids, by incorporating a mesophilic phase. The latter enhances the stabilization process, ensuring a more balanced and efficient system.

This solution operates in a draw-and-fill **batch mode**, allowing for the production of **hygienised sludge** that meets USEPA Class A biosolids standards or equivalent.

Coupling Digelis® BH_A process to our Advanced Heat Recovery solution to achieve autothermicity. This allows producing hygienised sludge while improving energy self-sufficiency.

Digelis® CleanHX
Advanced Heat Recovery system

Towards energy self-sufficiency for thermophilic anaerobic digestion.

SUEZ has developed a new sludge cooling and preheating approach that leverages vacuum cooling and direct condensation to optimize energy recovery. By operating under vacuum, the system lowers the boiling point of water, allowing for efficient cooling of the hot thermophilic sludge while transferring the heat to the raw sludge. This technology overcomes the limitations of conventional heat recovery exchangers, which are typically known for their high energy consumption related to pumping, increased maintenance needs, and significant footprint.

... what can it do for you

Footprint reduction
Up to 40% volume reduction compared to conventional AD

Energy neutral solution
- Use of Advanced Heat recovery solution with Digelis® BH_A process

Ease of operation
thanks to a low-tech solution for the production of hygienised biosolids

Among our references

Aix la Pioline, France
175,000 PE - Digelis® BH

Nice Haliotis II, France
680,000 PE - Digelis® BH

Okhla, India
3,500,000 PE - Digelis® BH_A with Advanced Heat Recovery

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