Thermal Hydrolysis Processes

- Reduce sludge volume
- Improve sludge quality
- Increase biogas production
Bio Thelys™ is a complete sludge reduction solution that works in batch mode, combining thermal hydrolysis and anaerobic digestion. Exelys™ is an innovative and complete sludge reduction solution that works in continuous mode. By coupling thermal hydrolysis with anaerobic digestion, BioThelys™ and Exelys™ offer enhanced performance over conventional digestion and optimize sludge treatment by producing:

- 25 to 35% less dry solids
- 30 to 50% more biogas
- No odours
- A pasteurised digestate, for safe reuse

Both processes handle all kinds of organic, industrial or municipal sludges and can also handle grease.

**Benefits**

- Reduced digester related investment for new installations
- Reduced operating costs with less sludge to manage
- Income is generated from:
  - Excess energy generated with more biogas
  - Excess capacity to process organic imports

**Operating Principle**

**Bio Thelys™**

Dehydrated sludge first goes through a batch thermal hydrolysis phase during which steam is injected in reactors operating under specific pressure (9 bars) and temperature (165°C) conditions for approximately 30 minutes.

**Exelys™**

Continuous thermal hydrolysis operating 24 hours a day with feed and removal levels that are adjustable in real time. Exelys™ operates under controlled temperature (165°C), pressure (9 bars) and residence time (approximately 30 minutes) conditions.

The system is controlled by a PLC that modulates the steam flow rate in line with the amount of sludge injected.
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3 configurations

Lysis/Digestion (LD) Configuration

Thermal hydrolysis is performed on the whole or a part of the sludge stream prior to digestion.

This configuration reduces digester volume by a factor of 2 to 3, reduces the amount of sludge and guarantees that it is sanitized while increasing biogas production.

Using the LD configuration, the throughput of an overloaded digestion plant can be doubled, thus avoiding the need to build additional digestion capacity.

Partial Lysis / Digestion (Partial LD) Configuration

The Hydrolysis reactor may process only the biological (secondary) sludge with corresponding enhancement on biogas production.

This configuration gives the client the greatest savings in regards to reactor capacity and steam consumption.

Using the partial LD configuration, digestion capacity of an existing installation can be increased by a factor of 2.

Digestion/Lysis/Digestion (DLD) Configuration

Veolia Patent

Thermal hydrolysis is applied to all of the digested sludge from digester 1. Then the sludge is cooled and diluted before breakdown continues in digester 2.

This is the optimum formula in energy terms as it uses less steam while producing more biogas and electricity. It also enables the greatest reduction in the amount of sludge to be produced.

A solution that guarantees energy and environmental performance

Many possibilities for using biogas:
> Conversion into ‘green’ electricity via co-generation
> Bio-methane production (for injection into the network or as fuel)

With external input (co-digestion), energy self-sufficiency or even a positive energy footprint may be achieved by the plant.

Thermal Hydrolysis combines with other Veolia sludge treatment processes and completes them to offer even more sustainable solutions.

Reduced carbon footprint of the facilities

Complete sludge pasteurization
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Complete sludge pasteurization
Our Bio Thelys™ References

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<th>Location</th>
<th>Year</th>
<th>Population</th>
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* PE: Population Equivalent.
** including sludge external input.

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Resourcing the world