



Energy from Anaerobic Sludge Stabilisation

ANAEROBIC STAGE



Organic energy worldwide

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Fluctuating energy prices and rising sludge utilisation costs necessitate innovative concepts for wastewater treatment plants using aerobic sludge stabilisation. An inexpensive anaerobic reactor made of stainless steel is a solution that is easy to implement and has been successfully employed in the biogas sector for many years.

Simple Procedure, Great Effect

For decades, the extraction of biogas for the production of energy has been an established process in the field of agriculture. WELTEC BIOPOWER has adapted this method for use in sewage treatment plants: The pre-treatment of the wastewater and the removal of contaminants remain unchanged. Instead of the aerobic sludge treatment in the open activation tank, the sludge is now digested under anaerobic conditions. The anaerobic digestion in the durable stainless-steel bioreactor delivers digester gas, a valuable source of energy. A stable digestion process helps avoid the release of climate-damaging gas into the atmosphere. Additionally, the COD load is cut by about 30 percent. At the bottom line, this smart combination of wastewater treatment and energy production improves the performance of existing sewage treatment plants.

Maximum Efficiency through Tried-and-Tested Technology

To treat the raw sludge effectively, a bioreactor is installed from strutted stainless-steel sheets with the tried-and-tested segmental construction method. This construction method ensures custom-tailored, individual design of the digester and a short construction time. Inside, a diagonally installed long-axis agitator mixes the sludge in order to gently promote the microbiological transformation to methane. To buffer the accumulating digester gas, the stainless-steel tank is equipped with a flexible double-membrane roof.

The use of stainless steel always pays: This high-quality material is very durable, has a long useful life and is suitable for all climate zones. Moreover, stainless-steel contains hardly any maintenance, resulting in low operating costs.

Thanks to its compact dimensions and the limitation to components really needed, the anaerobic stage occupies very little space. Thus, existing wastewater treatment plants can easily be upgraded.

Everything from One Source

WELTEC delivers more than the mere technology. All important steps on the way to anaerobic utilisation are handled by WELTEC – from the custom design and planning to the implementation and commissioning to the thorough training of the operating personnel.

- Technical and biological design
- Turnkey delivery of the plant:
 - Sludge handling (storage and transport)
 - Ready-to-operate stainless steel bioreactor
 - Variable gas storage thanks to double membrane roof
 - Complete gas train (processing, CHP plant, flare stack)
 - Control unit (compatible with the plant control)

Energetic Gain, Reduced Costs

In a combined heat and power (CHP) plant, the digester gas is continually transformed to thermal and electrical energy. The generated power can be used for various purposes, e.g. for the energy-intensive aeration stage. The produced heat can be used for speeding up the digestion process, for heating office and lab facilities or for drying sludge. Through the direct use of the power and heat, sewage treatment plants can cut their energy costs by up to 25 percent. The anaerobic stage also reduces the amount of accumulating sludge, resulting in lower disposal costs. Government subsidies and various investment programmes may be available for setting up this eco-friendly combination of energy production and sludge reduction. Thus, an anaerobic stage is also economically attractive.



Mono-Digestion or Co-Substrates

The WELTEC digestion system is designed according to the customer-specific needs. If co-substrates such as organic residues, abattoir waste or production leftovers are to be used in addition to the sludge, this is taken into consideration in the technical and biological design. WELTEC has many years of experience in the digestion of organic waste and sludge as well as in the combination of these input substances.

Throughput

	Output range	
	from	to
Population equivalents	8,000 PE	150,000 PE
Anaerobic reactor	Volume: 353m ³ Ø 8.45m, H 6.3m	Volume: 3,052m ³ Ø 24.83m, H 6.3m
CHP plant	15kW	500kW

GOALS & BENEFITS

- Sludge stabilisation
- Reduced sludge quantity
- Little space needed
- Capacity can be increased inexpensively
- Significant energy savings in the activation pool
- Extraction of digester gas suitable for producing energy
- Power and heat from the combustion of the digester gas
- Upgrade of existing wastewater treatment plants
- Various subsidies and investment grants possible
- Avoidance of climate-damaging emissions
- **Operating cost reduction**

