DP ADOS Mill & DP SEDI Tank

Technical Description

DP CleanTech

Creating value from waste

Transforming Waste into Feedstock

Introduction

Anaerobic digestion is a longstanding and proven solution for the treatment of organic and putrescible substrates. There are various different technologies available, all of which face the common challenge of managing impurities in the feedstock. Impurities can lead to equipment blockage, sedimentation, crust formation, abrasion, corrosion and other damage. In general, such problems will increase the maintenance and cleaning burden, and will reduce the efficiency of the process.

Regardless of the feedstock, proper pre-treatment is an essential step in optimising output, and minimizing problems and cost.

DP's solution has been developed and refined over many years to address and handle a broad range of feedstocks to prepare them for anaerobic digestion.

Types of Treatable Wastes

Organic Fraction of Municipal Solid Waste (OFMSW)

Food waste (packed and unpacked)

Industrial food processing waste

Market waste

Category III waste (according to the EU Directive Animal by Products Regulation 1069/2009)

Others (energy crops, animal dejection, industrial food processing rejects, activated sludge, etc.)

Pre-treatment Process Solution

DP's pre-treatment solution is based on 30 years of knowledge and successful operational experience in transforming organic waste to high quality feedstock.

The system consist of 2 core units - the ADOS Mill and the SEDI tank. These are individual components which together produce the highest quality feedstock from organic waste materials. These are co-located and integrated onto one footprint. As an integrated system, there are many additional benefits which increase efficiency and reduce costs.

- Extremely versatile
- User friendly
- Easily maintained
- Compact
- Highly efficient
- Maintains a semi-dry process, using a homogeneous slurry
- Up to ~15% solids content as output – (ideally 10-12%, optimal for bacteria activity and for SEDI Tank performance)
- Speeds up the activation of the biological processes
- Enables higher organic loads inside the digester
- Avoids big digester volumes
- Is not sensitive to feedstock fluctuations

ADOS Mill and SEDI Tank Description

The **ADOS Mill** is a specifically designed wet hammer mill that treats organic waste by reducing the size (shredding) of the waste, and performs the initial separation of clean and light non-organic fractions. After the ADOS Mill, the shredded substrate enters the first chamber of the second treatment unit, the SEDI tank.

The **SEDI Tank** is a dedicated tank, with 2 chambers specially designed to separate unsuitable material from the waste stream going to the digester, and to ensure optimal homogenization of the substrate.

Field data is monitored continuously to ensure that appropriate changes are made to the treatment parameters so that the optimal conditions are in place to maximise the conversion rate.

ADOS Mill

ADOS Mill Functional Processes:

- Waste materials size reduction and shredding
- The initial separation of a clean, dry 'light' non-organic fraction

ADOS Mill Description

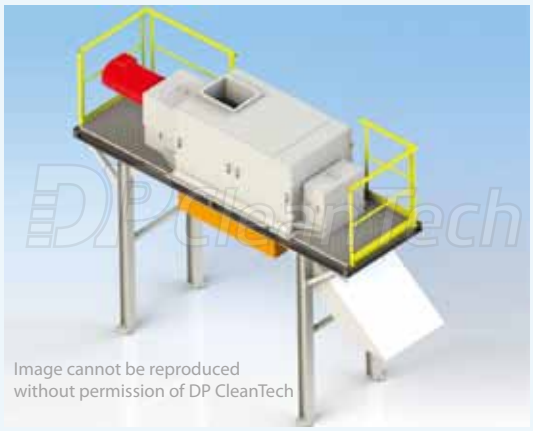
The ADOS Mill is a horizontal high-speed rotating wet hammer mill that performs an essential first process in preparing substrates for anaerobic digestion. The 'multifunction' equipment reduces the size of the substrate, and also automatically separates the light non-organic fraction from the main waste stream. The shredding process increases the surface of the organic waste particles, which improves the gas yields. The liquid content of the substrate needs to be regulated and adjusted to create a pumpable slurry. This is mainly achieved by using recirculated warm liquid digestate, which also increases the solubility of easily degradable compounds. The dosing of the liquid digestate can be regulated manually or automatically and is adjusted depending on the actual needs and on the configuration of the anaerobic system.

Construction:

- Heavy duty steel frame with connection flanges for support
- Screen pipe in with 12mm (changeable)
- Shaft with hammer bracket for mounting the hammers
- Easy maintenance and hammers replacement configuration
- Heavy duty bearings
- Stainless steel body
- Water and corrosion resistant construction

Technical Data:

- Diameter rotor: ø585mm
- Length rotor: 1.330mm
- Diameter screen: 600mm
- Installed power: 45kW
- Feeding opening: 450 x 360mm
- Discharge opening: 1300 x 890mm
- Maximum throughput: 8 tph
- Dimensions in operation (L x W x H): 3220 x 1135 x 1070mm
- Dimensions for transport (L x W x H): 3220 x 1135 x 1070mm
- Weight empty: 2.5 tons
- Number of Hammers: 36 pcs.
- Light fraction discharge opening (L x W): 200 x 990m
- Speed: 1440rpm



ADOS Mill with support structure

SEDI Tank

SEDI Tank functional processes:

- Separate unsuitable materials from the main waste stream using the swim-sink principle
- Ensure optimal homogenization of the substrate

SEDI Tank Description

When the shredded substrate enters the first chamber of the SEDI tank, which is located directly underneath the ADOS Mill(s) the material is mixed and homogenized using external agitation.

The substrate overflows into the second chamber, the "calm" zone, where a laminar flow and a suitable retention time allows the further separation of particles through gravity by means of the swim–sink principle. Heavy particles (such as stones, glass, etc.) settle, light particles (small plastic particles, styrofoam etc.) ascend to the surface.

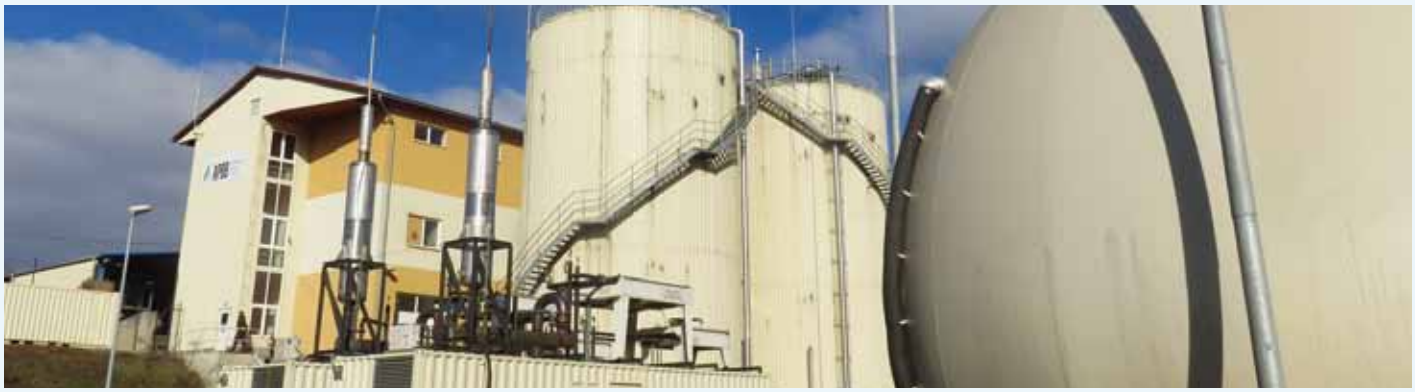
A special scraper device removes these fractions and generates a clean, pumpable slurry that is high in organic content and ready to be sent to the digesters for biological conversion. The separation of cooking oil can be accomplished at this stage. The use of hot digestate as the dilution source tends to separate the oil contained in the substrate, which then accumulates naturally on the surface of the liquid in the sedimentation tank. This oil/water/floating mixture or 'floating' layer can be diverted and treated using dedicated 3-phase decanters, and then collected for sale to the oil recycling market.

Construction:

- Heavy duty steel frame with connection flanges for support
- Stainless steel body
- Water and corrosion resistant construction

Technical Data:

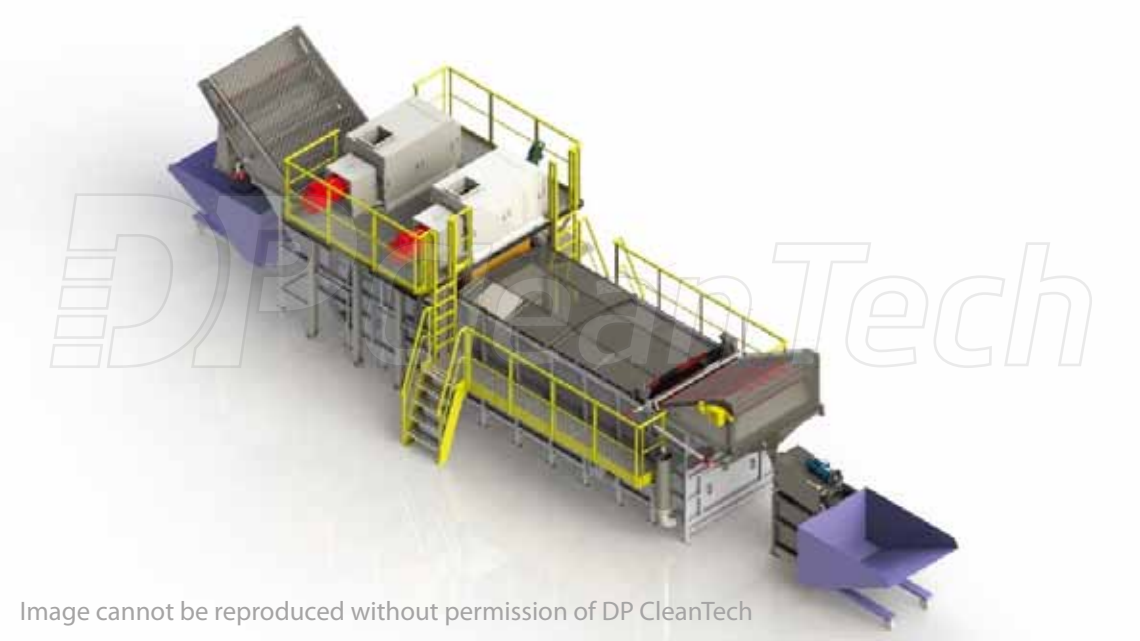
The integrated ADOS SEDI tank module is available in 2 sizes, depending on the required throughput.



Small Module 20m³:

- Total Volume: 20m³
- Volume homogenization section: 8m³
- Volume sedimentation section: 12m³
- Material quality: 1.4301 stainless steel
- Sheet thickness: 3mm
- Scraper conveyor for removal disturbing particles (installed power conveyor 0.25kW)
- Mixer for homogenization (installed power mixer: 2.2kW)
- Separation screen for floating layer to reduce the water content
- Submersible pump 0.2 kW for transporting the liquid back to SEDI Tank
- Dimensions in operation (L x W x H): 9200 x 4000 x 3790mm
- Dimensions for transport (L x W x H): 7360 x 2120 x 2230mm
- Weight empty: 5 tons
- Service platform
- Material platforms and ladders: customer specified (normal or stainless steel)

Large module 30m³:



- Total Volume: 30m³
- Volume homogenization section: 12m³
- Volume sedimentation section: 18m³
- Material quality: 1.4301 stainless steel
- Sheet thickness: 3mm
- Scraper conveyor for removal disturbing particles (installed power conveyor 0.25kW)
- Mixer for homogenization (installed power mixer: 2.2kW)
- Separation screen for floating layer to reduce the water content
- Submersible pump 0.2 kW for transporting the liquid back to SEDI Tank
- Dimensions in operation (L x W x H): 12200 x 4000 x 3790mm
- Dimensions for transport (L x W x H): 10460 x 2120 x 2230mm
- Weight empty: 7 tons
- Service platform
- Material platforms and ladders: customer specified (normal or stainless steel)

ADOS SEDI Tank Module Benefits

- Minimal energy consumption
- Low operational costs
- User friendly, easy to clean, maintain and operate
- Deliverable as plug & play solution
- Small footprint
- Available in 2 sizes
- Perfectly suited for all anaerobic processes
- Adjustability of water content
- Removal of heavy and floating particles
- Ideal homogenization of material
- No further pre-treatment required
- Capable of processing packed feedstocks
- Enhanced gas yield
- Extension of cleaning intervals for the digesters
- Separation of a clean and dry combustible fraction
- Oil separation unit*

*Optional

Contact Us

DP has 9 offices around the world in 8 countries – Austria, China, Czech Republic, Denmark, Poland, Thailand, UAE and UK.

To ensure that we can address your needs appropriately, please email **info@dpcleantech.com** for enquiries or further information.