AHT Product Scope -
Hydrothermal Carbonization

Overview

Another one of AHT's Feedstock Treatment solutions, is Hydrothermal Carbonization (HTC). Normally, wet feedstock such as sewage sludge cannot be briquetted due to them being too high in moisture. As such, in order to process them, they must first be dewatered, which is where our HTC process comes in. Through our process, a normally disposable material can be converted into a valuable resource, that can be efficiently processed for nutrient recovery and fuel production. Through a series of processes, the wet feedstock can become Hydrochar, which is a solid, coal-like fuel that can then be used for briquetting. As a result, our HTC process offers an economical and cost saving pre-treatment alternative, where a liquid material can be continuously converted into a coal-like product in a few hours.

Products

Within our Feedstock Utilization category, listed below is an example of our Hydrothermal Carbonization system that we offer.

Hydrothermal Carbonization System

Technical Data

Parameter	HydroChar Compact
Throughput	2 m^3/h
Processing Time	~2 hours
Acceptable Feedstock Types	Sewage Sludge / Manure / Fermentation Residue / Pomace
Dimensions (L x W x H)	35.3 x 20.2 x 4.5 m
Max. Operating Tempereature	220°C
Max. Operating Pressure	~20bar

Process Breakdown

1. First, the liquid material like sewage sludge is mechanically prepared in order to be easily pumped, and to enable reliable feeding into the system. The material is then also pressurized approximately 20 bar, and heated at approximately 200°C as well.
2. Next, the conditioned material is transferred into the HTC reactor, where process conditions are established to initiate Hydrothermal Carbonization under a controlled temperature and pressure.
3. Within the reactor, the liquid material is converted into a carbon-rich hydrochar at approximately 180–220°C and 20–25 bar. Furthermore, valuable nutrients such as phosphorus and nitrogen are transferred into the aqueous phase and can be efficiently recovered through heat recovery.
4. After that, the material is then cooled down via heat recuperation, and the residual heat is then transferred onto the inlet sludge. This heat can then be stored, or recycled back into the process in order to serve as energy for the carbonization process. As such, this efficient heat recovery minimizes energy consumption.
5. The resulting hydrochar is mechanically dewatered to achieve up to 70% dry solids, producing a material suitable for energy-positive utilization.
6. Finally, the hydrochar can be further processed, for example by briquetting into a lignite-like fuel for transport or direct on-site use, while integrated heat recovery minimizes overall energy consumption throughout the process, and enabling a closed-loop process.

Benefits

Through our syngas generation technology, a wide range of benefits can be achived, including:

01 Continuous Process Operation

Unlike other HTC approach that rely on a batch process, our approach focuses on continuity. As such, our approach has lesser downtime compared to other approaches, thus enabling higher throughput, and efficiency compared to others

02 Wet Feedstock Efficiency

Through our HTC process, wet feedstocks that tend to necessitate extra cost for disposal like sewage sludge, can instead be treated as a valuable resource that can generate revenue for municipalities

03 Reduced Transport Costs

Through using biogenic residual and waste materials that can be found within the region or on-site, transport costs can be minimized due to the massively shortened and reduced transport routes

04 Decentralized Energy

As our approach allows for local communities to potentially produce their own clean energy from on-site materials, this reduces dependance on the power grid, securing a self-sufficient and fossil-free energy supply

A.H.T. Syngas Technology N.V. • Bonngasse 23 • D-53111 Bonn

+49 2206 95 190-20
info@aht-cleantec.com
Bonngasse 23,
53111 Bonn Germany