



Technology Description (TD) for Substrate Pre-Treatment Technologies

Contact Information:

TECHNOLOGY/ EQUIPMENT SUPPLIER	<i>Name of institution:</i>	University of Warmia and Mazury in Olsztyn Centre for Research and Renewable Energy		
	<i>Name of contact Person:</i>	Marcin Zieliński		
	<i>Street:</i>	Oczapowskiego 8		
	<i>Town:</i>	Olsztyn	<i>Zip code:</i>	10-719
	<i>Country:</i>	Poland		
	<i>Phone:</i>	+48 89 523 4124		
	<i>e-mail:</i>	marcin.zielinski@uwm.edu.pl		
	<i>www:</i>	www.uwm.edu.pl/cbeo		
<i>Date (of filling the TD):</i>	21.10.2016			

Technology Description:

NAME OF TECHNOLOGY	Hydrodynamic disintegrator
ASSIGNMENT OF TECHNOLOGY	Biomass disintegration, pre-treatment before methane fermentation.
TECHNICAL READINESS LEVEL	<p>1 2 3 4 5 6 7 8 9</p>
<p>TRL 1 - basic principles observed TRL 2 - technology concept formulated TRL 3 - experimental proof of concept TRL 4 - technology validated in lab TRL 5 - technology validated in relevant environment (industrially relevant environment in case of key enabling technologies) TRL 6 - technology demonstrated in relevant environment (industrially relevant environment in case of key enabling technologies) TRL 7 - system prototype demonstration in an operational environment TRL 8 - system completed and qualified TRL 9 - actual system proven in operational environment (competitive manufacturing in the case of key enabling technologies; or in space)</p>	
TECHNOLOGY/EQUIPMENT AVAILABILITY	technology licence sellers Technology supplier has a prototype



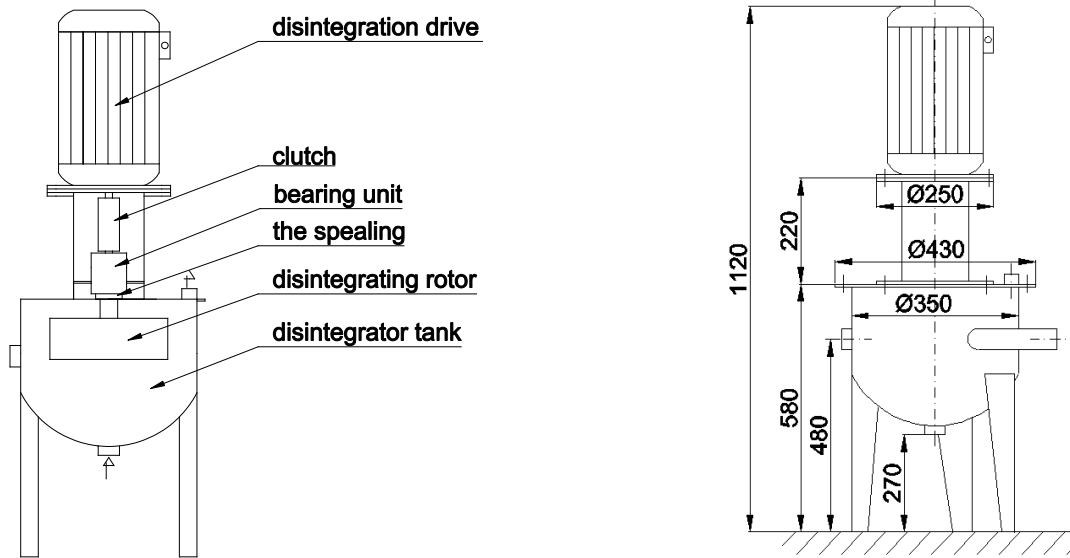
		functioning in technical scale. It is possible to test the technology for potential customers. The technology supplier is not a producing company.
PATENT RIGHTS		NO
METHOD OF MAKING THE TECHNOLOGY AVAILABLE	<i>Licence selling</i>	YES
	<i>Licence granting</i>	YES
POSSIBLE END USERS OF TECHNOLOGY	<i>Please name end users/ contacts that should be invited to project workshops</i>	Biogas plant operators

Description of the technology/equipment:

Hydrodynamic disintegrator

Hydrodynamic disintegrator, used in studies, consists of multifunctional rotor, which was made according to Patent PL 214335 B1, rotating inside the tank with a capacity of 25 L, driven by an electric motor with a power of 2 kW and a rotational speed of $n = 2800/\text{min}$. The rotor is mounted on a shaft of bearing unit inserted through the cover and the sealant to the interior of the tank, coupled with the engine by the rubber-metal clutch. The inlet port is located at the bottom of the tank and the outlet at the lid of the tank. The inlet and outlet are equipped with a 2" valves and connected by bypass with 2" valve to enable flowing of liquid and omitting the tank. Disintegrator tank also has additional 1/2" connectors, equipped with a temperature meter, manometer and valve for sampling.

After filling of the tank and running the disintegrator, substrate is pumped repeatedly through the rotor due to centrifugal force. Liquid is drawn into the tank, by the inlet port located in the axis of the rotor, and is processed flowing through the chambers located closest to the outer edge, and then is expelled outside the rotor. Flowing inside the rotor, through other channels and chambers, liquid is subjected to the alternating high and low pressure, which at the appropriate spin speed creates conditions for the formation and disappearance of cavitation bubbles, which is destructive to the structure of biological material (substrate). After a set time the motor stops the disintegrator and substrate is replaced. After disintegration, the substrate is removed from the tank during filling, as a result of displacement by new inflowing liquid.



Rys. 1 Hydrodynamic disintegrator - scheme

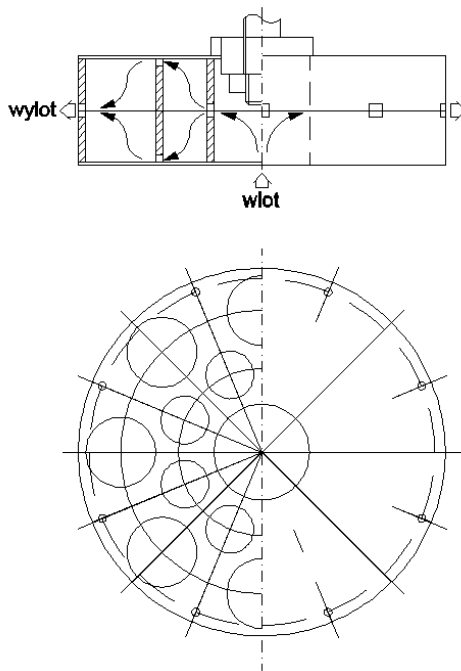


Fig. 2 The cavitation head



Fig. 3 Hydrodynamic disintegrator - photo