



Self-cleaning rotary boiler for solid waste

Boiler fouling and corrosion are two of the most challenging drawbacks when operating a boiler with solid biofuels such as the olive cake or poultry manure presenting a high LHV which makes them quite attractive to valorise them with energy purposes. However, the high content of unburned and chemical components leads to the generation of deposits on the heat exchangers. The consequences associated to these phenomena include the decrease of the boiler performance, clogging and corrosion occurrence. Traditional cleaning system operating in continuous mode do not guarantee a stable performance during operation neither the avoidance of deposits formation in the heat exchanger surfaces which implies the need to schedule regular shut-downs for maintenance.

This heat exchanger consists of several concentric coils connected in series, through which the system's heat carrier fluid circulates. The boiler is placed on a support equipped with turners, where, by the action of a gear motor, it rotates at low speed on the axis of the coils. This rotary movement, altogether with the winding direction of each of the coils forming the exchange body, leads the particles in suspension in the gas flow to an outlet enabled for their discharge. In addition, the boiler body will have a cleaning system by means of particle discharge responsible of dragging the solids that may have remained adhered, all without the need to stop the installation at any time. Currently 14 equipment have been already installed (Spain and United Kingdom).

One of the main advantages of the self-cleaning rotary boiler derives from its capacity to operate with materials that contain a high percentage of ash and dust without affecting its performance (while other systems are not able to work with ash rates higher than 11 %) and savings associated to the compressor for blower cleaning allow to avoid the cost of compressor purchase, pipe installation and electricity consumption. In addition, the equipment, which is able to reach a stable performance due to the exchange surface, is kept clean. In this sense, periods of shutdown associated to maintenance operation are reduced, which affects not only the production but also maintenance operations required. It is also worth highlighting its installation versatility since the heater allows different locations with respect to the combustion chamber. Therefore, the equipment provides a solution to achieve an adequate performance when valorising solid waste for energy purposes.



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COUNTRY

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ADDITIONAL INFORMATION

The HORIZON + boiler's own rotary design and coil configuration allows the ash to be extracted automatically. The boiler can be developed for power ranges up to 12 MW and it can adapt to different combustion systems. The plant layout could be in line, L-shaped, U-shaped or by positioning the boiler over the furnace.

It is possible to modify the number of coils according to the requirements of the project. The number of coils can be varied, as well as their length and diameter.

In a traditional blower-cleaned exchanger, the ash is lifted and mixed with the gases during the cleaning process. This makes it easier for suspended solids to reach the analysis inlets and filters, preventing compliance with regulations and shortening the life of the filtration equipment. The continuous cleaning of the HORIZON + boiler does not generate variations in the concentration of solids in the gases.



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ABOUT BRANCHES

BRANCHES is a H2020 "Coordination Support Action" project, that brings together 12 partners from 5 different countries. The overall objective of **BRANCHES** is to foster knowledge transfer and innovation in rural areas (agriculture and forestry), enhancing the viability and competitiveness of biomass supply chains and promoting innovative technologies, rural bioeconomy solutions and sustainable agricultural and forest management.



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THE PARTNERSHIP

