

ABSTRACT

A process and system for producing synthesis gas from biomass by carbonization are provided. The system comprises a pre-treatment part for biomass raw material, a carbonization furnace (4), a gasification furnace (20) and a pipeline connection and gas delivery system thereof. The top of the carbonization furnace (4) is connected with a cyclone separator (5), and the output end of the cyclone separator (5) is connected with a combustion bed (7) and a charcoal hopper (12) respectively. The output end of the combustion bed (7) is connected to a heat exchanger (9) for heating cycling pyrolysis gas. An outlet of the heated pyrolysis gas is connected with the carbonization furnace (4), and an outlet of the heat-exchanged waste heat flue gas is connected with a drying system (2). The pipeline from a charcoal outlet of the carbonization furnace (4) to the charcoal hopper (12) is provided with a water-cooling screw conveyer (11) which cools the charcoal from the outlet of the carbonization furnace (4) to 60-280°C and then conveys it to the charcoal hopper (12). The pipeline from the outlet of the charcoal hopper (12) to the gasification furnace (20) is provided with a mill (13), a charcoal slurry tank (16) and a high-pressure charcoal slurry pump (17) in turn. A gas supply pipe of the burning bed (7) is connected with an air pipeline (6), thereby supplying air as combustion-supporting gas.