Biomass and fossil fuel conversion by pressurised fluidised bed gasification using hot gas ceramic filters as gas cleaning

Gasification of biomass and fossil fuels, hot gas cleanup using a ceramic filter and combustion of LCV product gas in a combustor were performed using a 1.5 MWth test rig (pressurised bubbling fluidised bed gasifier) at Delft University and a 10-50 kWth system at Stuttgart University (DWSA) in the framework of experimental research on efficient, environmentally acceptable large-scale power generators based on fluidised bed gasification. The influence of operating conditions (pressure, temperature, stoichiometric ratio) on gasification (gas composition, conversion grades) was studied. The gasifiers were operated in a pressure range of 0.15-0.7 MPa and maximum temperatures of ca. 900°C. The Delft gasifier has a 2 m high bed zone (diameter: 0.4 m) followed by a freeboard approximately 4 m high (diameter: 0.5 m). The IVD gasifier has a diameter of 0.1 m and a reactor length of 4 m. Carbon conversions during wood, miscanthus and brown coal gasification experiments were well above 80.