

Using the Bomb Calorimeter

Description

Before running the gasifier, HHV was tested by a bomb calorimeter. Due to the different chemical composition, the HHV of different biomass fuels vary from each other. A bomb calorimeter is an instrument used to measure the heat released from combusting a specific amount of biomass sample, and it calculates the HHV of this biomass fuel. In each testing, about one gram of sample fuel is ground and condensed to fit in a capsule for combustion in the bomb. The released heat through combusting the fuel raises the temperature of water surrounding the bomb. With the temperature rise and the specific mass of fuel, the gross heat of fuel is calculated.

The calorimeter used in this research is a microprocessor controlled, Isoperibol Model 6200 Calorimeter manufactured by Parr Instrument Company as shown in Figure 1.



Figure 1: Model 6200 calorimeter from Parr Instrument Company

Figure 2 shows a standard 1108P oxygen bomb in the calorimeter that fits in a temperature-controlled water jacket with a built-in circulating system and electric heater. This 350 ml volume bomb is able to liberate up to 8000 calories per charge, and supports a maximum energy release of 42 kJ.



Figure 2: 1108 Oxygen Bomb

Figure 3 is a 6510 water handling system used for cooling the heated bucket water back to the desired initial temperature. This 6200 model can achieve automatic standardization through calculating energy equivalent value.



Figure 3: 6510 Water Handling System