

## WOOD WASTE AS A FUEL

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At current energy prices the economics of using wood waste as a source of energy seem to be favourable when an efficient burning system is utilised.

Pot furnace tests were carried out for wood bark pellets, wood chips and for an Australian coal. Proximate and ultimate analysis were discussed. The bulk density of each of the materials was measured before each pot furnace test. From the ultimate analysis data the theoretical air requirement for each material was calculated and used in the combustion curve calculations. The combustion rates and heat release rates at different percentage primary air flow rates are compared for the three different materials.

Pot furnace was utilised in these experiments because it is an apparatus in which the effect of variables can be evaluated under closely controlled conditions. The results of the experiment, carried out are discussed and the data are used to demonstrate the possibility of burning these materials on grates that are already firing coal. The experience and results obtained from these pot furnace tests also become very useful in designing plants burning the respective fuel.

Combustion in a fixed bed takes place in two stages. During the first stage the secondary flame over the bed is strongly luminous, this indicates the burning of volatile matter. During the second stage it is a clear blue flame indicating higher carbon monoxide concentration in the gases undergoing combustion. This occurs when the combustion of the devolatilized fuel takes place.

Most of the difficulties experienced in the combustion of solid fuels are usually associated with the second stage which is the burning out of the solid carbon. Troublesome clinker are formed during this stage in burning wood bark in a pot furnace. This was mainly due to high fuel bed temperatures when the bed consisted of an incandescent mass of coke. After the pot furnace tests the ash was collected and analysed for its inorganic constituents. The ash fusion temperature was measured using an electric furnace according to the ASTM standards. These results are discussed in order to find out means of avoiding the formation of troublesome clinker in burning these materials in industrial plants.