BIOMASS
CHARACTERISATION AND PROPERTIES

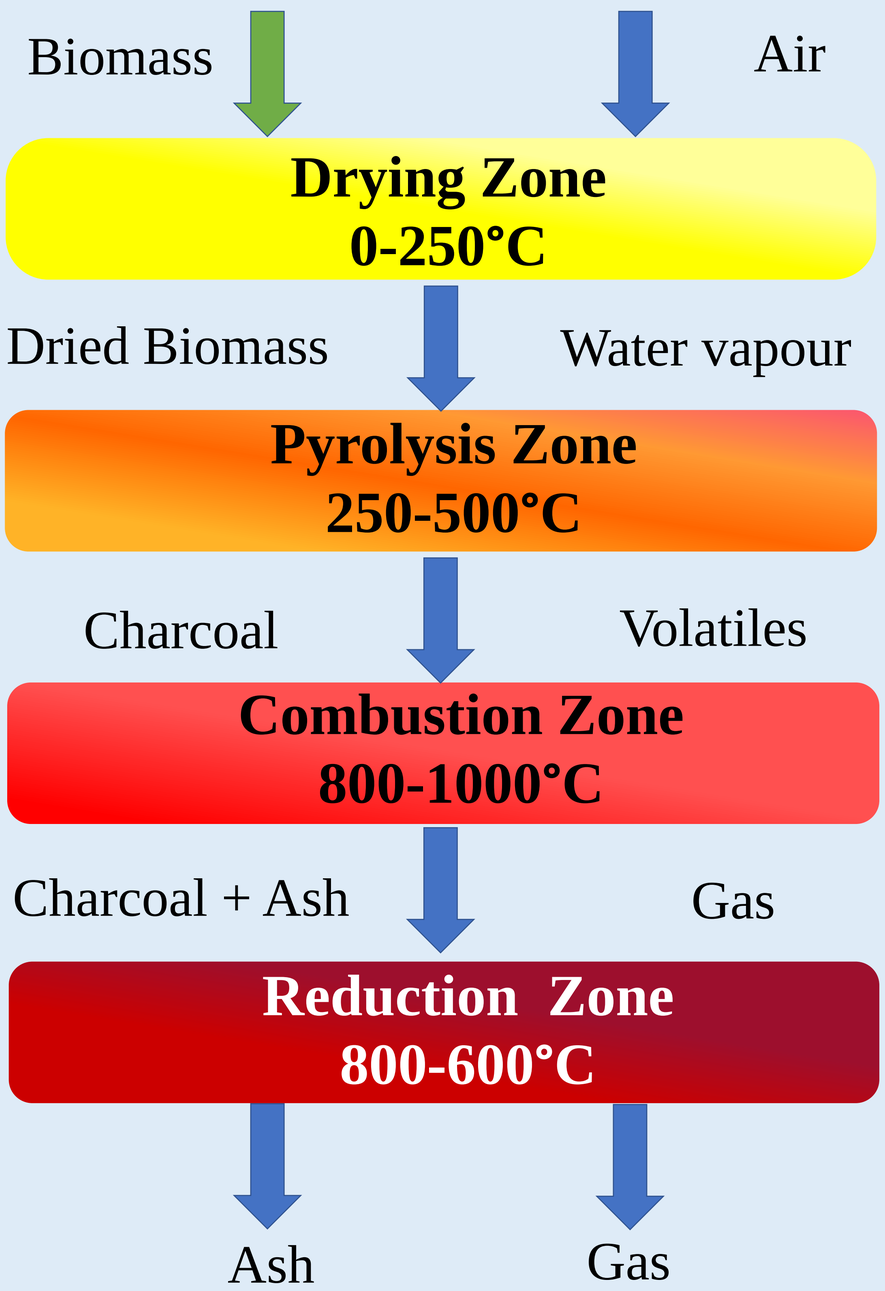
COMPOSITION AND SINGLE PARTICLE ANALYSIS

Proximate and Ultimate Analysis: Biomass analysis comprises of macro compositional approach which determines the moisture, ash content and volatile matter; Micro compositional approach helps in determining the compounds such as Carbon, Hydrogen, Oxygen, Nitrogen and Sulphur. The macro composition is evaluated through Proximate analysis and the micro composition is evaluated through Ultimate analysis.

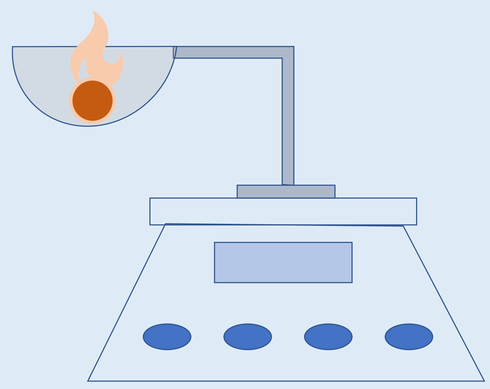
Typical proximate and ultimate values of biomass are noted below.

Sample	Form	Composition	Ultimate Analysis			Proximate Analysis			Density (kg/m^3)	LCV (MJ/Kg)
			C (%)	H (%)	O (%)	Moisture %	Ash %	Volatility %		
Agro-residue Biomass	Pellets	40% Paddy Straw, 40% sawdust, 20% Coffee Husk	43.6	5.6	44.6	11.73	6.29	63.37	1270.82	15.34
	Pellets	Mulberry	45.7	6.1	41.8	7.76	6.36	74.1	1053.25	17.75
	Briquette	Coffee husk, Sawdust, Woodchips	42.2	5.4	46.1	9.9	10.06	66.68	775.06	14.56
Wood Biomass	Rectangular Blocks	Casuarina Wood	52.0	6.5	41.4	12.5	2	67.5	833.45	20.29

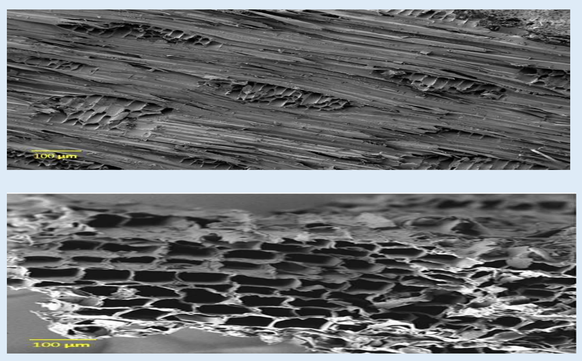
Single Particle Analysis: Single particle analysis establishes nature of the biomass particle under different thermochemical conditions. It helps in determining the burn-rate and burning behaviour of the biomass sample in the gasification reactor.



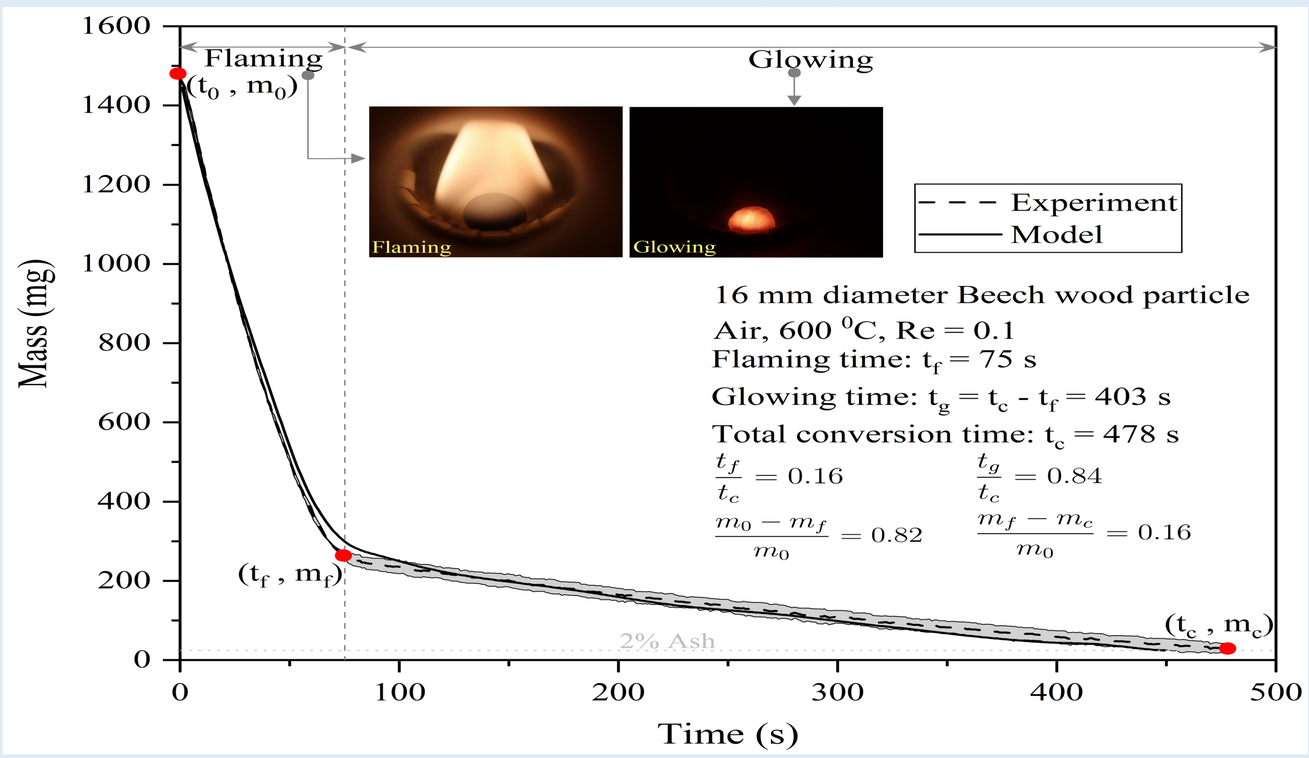
Schematic representation of the Gasification Process.



Schematic of the experimental arrangement



Pore Size of the biomass particle before and after the Pyrolysis Zone



Mass VS Time plot

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