

Atthaphorn Sakulsom 2008: An Experimental Study of Pyrolysis of Beach Makha and Teak in a Cone Calorimeter. Master of Engineering (Mechanical Engineering), Major Field: Mechanical Engineering, Department of Mechanical Engineering. Thesis Advisor: Mr. Nathasak Boonmee, Ph.D. 87 pages.

An experimental study of wood pyrolysis was performed in a cone calorimeter. The experiments were conducted for three wood species: Beach, Makha, and Teak. A wood sample was insulated on sides and back to promote a one-dimensional heat transfer. The wood sample was exposed horizontally to the cone heater where a heat flux direction is perpendicular to wood grain orientation. The applied incident heat fluxes were 15, 20, and 25 kW/m². A mass loss of each wood sample was continuously recorded by a load cell and a video camera was used to view the sample surface. Based on a video recording, an experimental glowing ignition time defined as the first time when a glowing spot appears on the wood surface could be determined. From the evaluation of the glowing ignition time, it was found that the critical heat fluxes for glowing ignition for Beach, Makha, and Teak were 2.18, 4.04, and 6.97 kW/m² respectively. The thermal inertia were 0.0222 0.0039 and 0.0062 J² m⁻⁴ K² s⁻¹. The experimental study found that at steady state the pyrolysis rate increased with an incident heat flux.

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Thesis Advisor's signature

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