

Abstract Submitted
for the CAL09 Meeting of
The American Physical Society

Development of a Laminar Flame Test Facility for Bio-Diesel Characterization GIAM TAN, NA — The relevance of applying testing standards established for diesel fuels to evaluate bio-diesel fuels motivates the design and fabrication of a vertical combustion chamber to be able to measure flame speeds of the varying strains of bio-diesel fuels and to attain more detailed kinetics information for biodiesel fuel. Extensive research is ongoing to understand the impact of fundamental combustion properties such as ignition characteristics, laminar flame speed, strain sensitivity and extinction strain rates on emission and stability characteristics of the combustor. It is envisioned that further flame studies will provide key kinetics validation data for biodiesel-like molecules – the current test rig was developed with provisions for optical access and for future spectroscopic measurements. The current work focuses on laminar flame speeds since this important parameter contains fundamental information regarding reactivity, diffusivity, and exothermicity of the fuel mixture. It has a significant impact upon the propensity of a flame to flashback and blowoff and also serves as a key scaling parameter for other important combustion characteristics, such as the turbulent flame structure, turbulent flame speed and flame's spatial distribution etc. The flame experiments are challenging as the tested bio-fuel must be uniformly atomized and uniformly dispersed.

Giam Tan
NA

Date submitted: 19 Oct 2009

Electronic form version 1.4