

Suronggon Petcharak 2008: Design of a Downdraft Gasifier Using Computational Fluid Dynamics Method. Master of Engineering (Mechanical Engineering), Major Field: Mechanical Engineering, Department of Mechanical Engineering.
Thesis Advisor: Assistant Professor Wichai Siwakosit, Ph.D. 88 pages.

This study demonstrates a design of a downdraft gasifier using a computational fluid dynamics method, which enables a designer to specify a fuel consumption rate and a heating rate of a gasifier. The results from computer simulations and heat transfer relationships can be used to predict fuel consumption rates at several equivalence ratios. At equivalence ratio of 4, a mass loss rate has been predicted to be between 159.588 kg/hr and 302.832 kg/hr for 20 mm. to 60 mm. fuel sizes, respectively.

This study has also compared the fuel consumption rate from the results with a real downdraft gasifier, built according the design with 300 kg/hrs fuel consumption rate, and found that the computer simulations produce agreeable results.

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Thesis Advisor's signature

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