DESIGN AND FABRICATE THE CLEANING CUM COOLING SYSTEM FOR DOWNDRAFT GASIFIER

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"I declared this thesis is the result of my own work except the ideas and summaries which I have clarified the resources. The thesis has not been accepted for any degree and is not currently submitted in candidature of any degree"

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ABSTRACT

Cleaning cum cooling system is a mechanism to filter the unwanted particle produce by biomass gasification along with producer gas from downdraft gasifier. This cleaning gas device is the third stage after downdraft gasifier and heat exchanger before extracted to the various application. The objectives of this project are to design the cleaning cum cooling system by using Solidworks 2016 software, to fabricate the mechanism by lab-scaled dimensions and to cool and filter the producer gas from unwanted particles. A few researches regarding the gas cleaning system have been study by look into the nature of the unwanted particle in producer gas. By studying all of these properties, a new design or stage of gas cleaning system have construct under a few considerations. This stage of mechanism is compulsory to avoid the problem when used the producer gas in a various application. All three stage of filter body have the similar dimension starting from water scrubber, tar absorber and silica gel which are 110mm diameter and 400mm height. The body for all stages of filter body and connecter have been fabricate using PVC pipe because it easy to fabricate and craft.. The lowest temperature out after past trough cleaning cum cooling system was 30.9℃ which near to the ambient temperature. Many dust and concentrated tar in producer gas have been filtered in this system. Syngas have been produce nicely and presence of blue flame appear. The expected results have been obtained.

Keywords: *Biomass gasification, Gas cleaning, Tar separation, Particle separation, Moisture absorber.*

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