

## Heat Exchanger for Biomass Pretreatment in Production of Ethanol

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**Categories:**

- Agriculture
- Green Technology

**Keywords:**

- Agriculture
- Biofuels
- Biomass
- Cellulose
- Ethanol
- Green Technology
- Heat Exchanger
- Heat Transfer
- Lignin

In recent years, there has been focus in producing fuels from renewable, non-petroleum resources to reduce the burden of pollution in the environment. Fuel ethanol has been produced by fermentation of biomass feed stocks of cornstarch, sugar cane and sugar beets, however these are limited due to competition from the food industry and increasing prices of these material. Lignin is present in this biomass, surrounding the cellulose that will be hydrolyzed, therefore pretreatment processes such as size reduction, steam explosion, and chemical hydrolysis has been explored. However, due to their complexity there is a need to find a more efficient method for the production of ethanol.

Researchers at Purdue University have developed a method whereby particulate lignocellulosic biomass is mixed with an aqueous medium to make an aqueous biomass slurry. This slurry is passed through an outer compartment with a heat exchange fluid flowing through the inner compartment, thereby allowing heat exchange between the two passages. This provides effective pretreatment of the biomass to allow enzyme hydrolysis and production of ethanol. Additionally, lignocellulosic biomass feedstocks are available in large quantities and are relatively inexpensive from sources such as corn fiber, oat straw, soybean stover, sawdust, and cordgrass. Hence, this has improved use in the biofuel and ethanol industries compared to current methods.

**Advantages:**

- Effective pretreatment using heat exchange
- Cost effective

-Larger quantities of raw materials

Potential Applications:

-Biofuel and ethanol production

**People:**

- Ladisch, Michael R (Project leader)
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**Intellectual Property:**

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