

DEWATERED BIO-BASED FUELS



Alternative Fuels |

Country: United States

Key Benefits: Fermentation Product Concentration

Products: LCI Vertical Thin Film Evaporator

Background:

Our Client had success with a lab-scale fermentation reaction & needed to evaluate scale-up options for concentrating a fermentation broth from 24 to 55% total solids, and oils, in a single pass.



**16m² LCI Vertical Thin Film Evaporator Skid System –
Evaporator Model LVSI-1600**

Problem:

Initial trials by the Client used traditional evaporation techniques such as falling film evaporators with multiple steps, fouling & increased viscosity during evaporation & concentration – all were processing obstacles.

LCI Solution:

Pilot testing trials at LCI Corporation's facility in Charlotte, NC proved a thin film evaporator could successfully concentrate the broth to high viscosities, but would also prevent premature fouling. During a continuous run, it was discovered that the thin film evaporator had the advantage of a single step process, when compared to traditional evaporation & distillation techniques previously tested.

For the design, a complete modular skid was supplied reducing installation costs & time:

- A two-stage condenser was designed where the first stage is a feed preheated/economizer
- The evaporator was constructed with an integral bottom tank to minimize overall system height & allow it to fit into an existing facility
- Food processing expertise aided in the design of a proprietary bottom cone design allowing for easy discharge of the concentrate to a transfer pump

End Results:

Commissioning was completed successfully. The Client is evaluating other applications that may benefit from thin film evaporation & possible capacity expansions, globally.