

ALTERNATIVE FUELS

COUNTRY: USA

PRODUCT: LCI Vertical Thin-Film Evaporator

KEY BENEFIT: Fermentation Product Concentration

Dewater Bio-based Fuels

Problem:

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

Initial trials by the client used traditional evaporation techniques such as falling film evaporators but multiple steps, fouling, and increased viscosity during evaporation/concentration were processing obstacles.

LCI Solution:

Testing: Pilot trials at LCI'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.

Design: A completed modular skid was supplied reducing installation costs and time. Design highlights:

- A two-stage condenser system was designed where the first stage is a feed preheater / economizer.
- The evaporator was constructed with an integral bottom tank to minimize overall system height and allow 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.

Results and Comments:

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



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