

# CORN OIL EXTRACTION



## Non-Shear Direct Steam Injection (DSI) Heaters

Hydro-Thermal's Non-Obstructing Heater (NOH), and Solaris are non-shear heaters that provide accurate and consistent temperature control. Steam legs utilizing a low point drain can be tied into the plants steam condensate discharge off first effect evaps, sent to the DA tank and ultimately become part of the boiler makeup supply stream. Adjustments to the centrifuge can further optimize corn oil yield.

### Why it works: Stoke's Law

Optimizing corn oil extraction is governed by Stoke's Law. While several factors make up Stoke's Law, using Hydro-Thermal non-shear heaters act to decrease the viscosity of the thin stillage resulting in increased yield. The added temperature acts as an emulsion breaker allowing for a possible reduction in emulsion breaker chemical dosing.

$$V = \frac{d^2(\rho_{\omega} - \rho_o)r\omega^2}{18\eta}$$

#### Increase separation by modifying variables:

Increase the droplet size of the oil.  $d^2$       Change the density of the liquid.  $\rho_{\omega} - \rho_o$   
 Increase the settling force or g-force.  $r\omega^2$       Decrease the dynamic viscosity.  $\eta$

## Hydro-Thermal's non-shear heaters results in increased corn oil production.

By heating the thin stillage/syrup beyond normally targeted temperatures, ethanol producers can achieve their minimum feed tag specifications while increasing corn oil yield, and ultimately increasing revenue. Our non-shear heater is strategically placed between the evaporators and centrifuge. If a heat and hold tank is incorporated in your facility, the heater is placed before the tank.



## Summary

Using Hydro-Thermal's non-shear DSI heaters are ideal for corn oil production because it can:

- Reduce or eliminate the emulsion breaker chemical
- Provides precise/consistent temperature control
- Optimizes oil production
- Help increase revenue

**Beyond corn oil production, Hydro-Thermal's products can help ethanol producers achieve their production goals throughout their entire facility**

### Learn more at:

Go to [www.hydro-thermal.com](http://www.hydro-thermal.com) or  
 Contact us at [info@hydro-thermal.com](mailto:info@hydro-thermal.com)

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