



## Hydro-Thermal's Non-Shear Heaters Result In Maximized Extraction Of Industrial Oil Waste Or Non-Hazardous Liquid Waste Streams

Our non-shear heater will heat your oil waste stream to the optimal temperature, to maximize oil extraction via your centrifuge, decanter, or tricanter process. With precise temperature control, oil yield (and ultimately revenue) can be increased.

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

Hydro-Thermal's Non-Obstructing Heater (NOH) is a non-shear heater that provides accurate and consistent temperature control. The NOH enables:

- Ability to use low steam pressure (15 psig and below) to achieve trim heating.
- Excellent temperature control with Class IV shut off design to prevent steam leakage.
- Non obstructive flow path ensures no plugging and handles large sized solids.
- Diffuser metallurgy selected to provide excellent abrasive wear.
- Explosion proof package available for environments having presence of methane gas.
- Supplied as a package to enhance easy calibration on controls with the system.

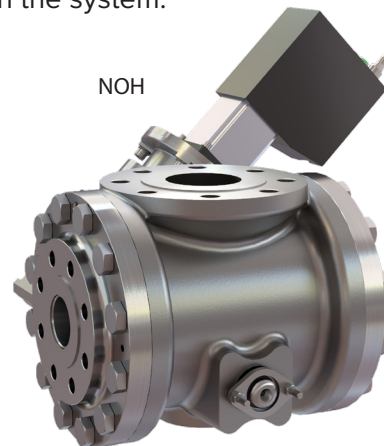
### Why It Works: Stoke's Law

Optimizing 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 and increase the relative density of the waste oil stream, resulting in increased yield. The added temperature enables a possible reduction in emulsion breaker chemical dosing.

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

#### Increase separation by modifying variables:

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



## Summary

Using Hydro-Thermal's non-shearing NOH design reduces or eliminates the emulsion breaker chemical, provides precise/consistent temperature control, and optimizes oil production.

**Beyond oil production, Hydro-Thermal's products can help 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)