

# Evaporate and Concentrate Fluids with Safe, Direct Heat

INTRODUCING THE

# PYROS™

Powered by ShockWave Power™ Reactor Technology

## HEATING SYSTEM



The PYROS Series 14 is a versatile, self-contained, tank-to-tank, continuous evaporation system. Fluid from a tank is pumped into the PYROS Series 14, heated to evaporation temperatures, and concentrated based on sophisticated instrumentation. The concentrated fluid is then pumped out of the unit at safe, tank-storage temperatures. The PYROS 14 is the most versatile unit and encompasses the Series 1 through 4 systems on one skid. For example, not only can the PYROS concentrate fluids, it can produce high-pressure, super-heated steam.

The PYROS™ Series 14 harnesses the power of controlled cavitation to heat most any fluid safely and effectively. The technology is built around the patented Shockwave Power™ Reactor (SPR)\* that heats any fluid without a flame, and is by definition, non-scaling heat. Evaporation and concentration take place in a specially engineered flash tank in which fluid is continuously circulating. Cold fluid comes into the circulating loop where it is heated to boiling, then it continues to circulate until it is concentrated. The hot concentrated fluid is pumped out through a heat exchanger that cools it to less than 150° F for tank storage. Raw fluid is always being pumped into the system and concentrated fluid is continuously pumped out.

The PYROS Series 14 also synergistically takes advantage of engine exhaust heat to maximize produced heat. The SPR efficiently converts shaft horsepower from the diesel engine into heat, but a diesel engine, by definition, loses much of the heat in diesel fuel to exhaust gas. The PYROS 14 includes a heat exchanger to recover exhaust heat. That raises the efficiency of the unit to compare favorably with a steam boiler, but without the related safety issues.

Designed for mobility, the system is fully contained on a 30' skid. The PYROS Series 14 is diesel driven with all the ancillary support systems. It does not require any additional services, and can be run anywhere as a stand alone unit.

\* Total Separation Solutions is the exclusive licensee for SPR technology in the oil and gas industry.  
License provided by Hydro Dynamics, Inc.



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- **Controlled Cavitation Plus Heat Recovery**
  - Converts shaft horsepower into heat
  - Exhaust heat is used to increase efficiency
  - Exiting hot concentrate is cooled with incoming fluid
  
- **Continuous Evaporation**
  - Fluid is continuously heated and circulated through flash tank
  - Sophisticated Process Logic Control (PLC) with instrumentation automates process
  - Input fluid is efficiently evaporated and exits the PYROS as concentrate
  
- **Shockwave Power™ Reactor**
  - Harness the power of controlled cavitation
  - Proven technology for heating fluids
  - Spinning disk with closed boreholes creates an area of low pressure
  - Tiny cavitation bubbles form and collapse
  - Restricting the cavitation inside the boreholes prevents damage
  
- **Specifications**
  - Cummins KTA-19
  - Hydro Dynamics 32-inch Shockwave Power Reactor
  
- **Performance Specifications**
  - 2,500,000 BTU/hour of safe heat
  - 2,500 pounds of steam/hour
  - Steam equivalent to a 75 HP boiler
  - 41,700 BTU per minute
  - Consumes 33 gallons of diesel per hour
  - Steam at 100 PSI, 340°F
  - Heat water 40°F continuously at 125 gpm
  - Heat oil 100°F continuously at 125 gpm
  - Based on Oil with SG=0.83 and 0.50 specific heat
  
- **Dimensions**
  - Skid 8.5 feet by 30 feet
  - Total weight 30,000 pounds



## ***TOTAL SEPARATION SOLUTIONS, LLC***

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