

# THERMOENERGY™ TurboFrac® 4000



## Production of Hydrofracking-Quality Water from Flowback and Produced Waters

ThermoEnergy's TurboFrac® 4000 System processes flowback and produced water from wells, lagoons or other similar sources with TDS (Total Dissolved Solids) content of more than 30,000 to 250,000 mg/l. Typical throughput is 4,000 barrels or over 165,000 gallons of water per day with an estimated recovery of 65-90% at less than 500 ppm total dissolved solids in the distillate. The system is based on ThermoEnergy's patented and proprietary CAST® technology and consists of four CAST vessels in series. CAST is an evaporative process that uses flash vacuum distillation to separate out TDS from water. CAST was developed for difficult to treat high TDS industrial waste water. By using flash vacuum distillation, TurboFrac™ is able to treat both very high TDS waters in the range of 100,000 to 250,000 mg/l that other evaporative processes cannot. In addition, by staging the CAST® vessels, the system has energy consumption equal to MVR/crystallizers at significantly lower capital costs.

TurboFrac can be combined with other pre-treatment technologies, such as degasifiers, to remove H<sub>2</sub>S gas from the incoming feed water, coagulation and flocculation to remove fracking chemicals, and a multimedia filter to remove suspended solids. The final product or distillate from the TurboFrac can be reused as fracking source water or discharged. TurboFrac is mounted on one skid with another skid for heating and cooling equipment. In addition to the primary components, the TurboFrac 4000 System is fitted with a fully automated PLC driven control panel with touch screen HMI, SCADA, remote monitoring and control, and video monitoring. All motors are driven by programmable

*Recycle flowback and produced water into frack water. Eliminate wastewater trucking to disposal sites.*

### Advantages Over Other Evaporative Systems

- Higher water recovery
- Higher initial TDS concentration
- Lower capital/operating cost per barrel of effluent treated
- Lower energy consumption than MVRs

(Continued)



*ThermoEnergy  
staged CAST®  
system under  
construction*

variable speed drives with overload and circuit protection contained in two NEMA 4X FRP or Explosion Proof Power Distribution Panels. The system requires a 443 kw, 480 volt, 3 phase, 60 Hertz power supply. The System's structural components are welded carbon steel painted with chemical resistant, UV stabilized epoxy. Additional information is available upon request.

Sample Field Performance on Produced Water					
Parameter	Unit	Raw	Degassed	TurboFrac Distillate	Drinking Water
TDS	Mg/l	250,000	245,000	120	500
Sulfate	Mg/l	1,313	2,700	4	250
Ca Hardness	Mg/l as CaCO <sub>3</sub>	7,820	6,500	54	
Chloride	Mg/l	124,000	124,000	91	250
Hydrogen Sulfide	Mg/l	500	10	ND	
General Characteristics					
Electrical	Load 443 kw; delivery 480 volt, 3 phase, 60 Hertz				
	Thermal	12 Million BTU			
Chemistry	TDS	Intake > 30,000 mg/l			
		Outflow < 500 ppm			
Reject Range	About 20-30% depending on feed water quality				

*Learn why ThermoEnergy's  
TurboFrac® is the ideal choice for  
flowback and produced water  
treatment at your fracking site.  
Email [info@thermoenergy.com](mailto:info@thermoenergy.com) or visit  
our website at [www.thermoenergy.com](http://www.thermoenergy.com).*

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