

# PALM TECHNOLOGY, INC.

## ENheat™

### COMPACT HEAT EXCHANGER

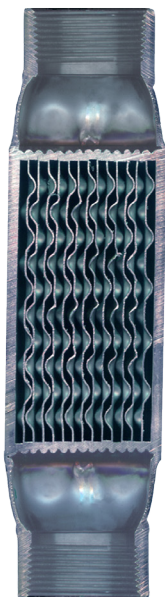
#### ENHeat

The EnHEat is a very compact, light weight, heat exchanger with a unique, patented, enhanced surface designed to combine high heat transfer coefficients with low pressure drops. Enheat models are typically one third the size and weight of comparable shell and tube or plate coil exchangers. They are the ideal method of heating electroless nickel plating solutions. They are also very useful for other plating applications where either heating or cooling are needed.

The Enheat, even with its very small size, has a pressure drop equal to or lower than those of shell and tube units. This accomplished while transferring heat at rates as much as five times those of other exchangers. The overall heat transfer coefficient for these exchangers with pressurized hot water is typically 600 to 1200 BTU/hr °F ft². They are equally efficient in cooling services.

#### More Economical

Enheat's compact design uses less material to construct an exchanger. This advantage, combined with their superior efficiency, means that smaller, lower cost exchangers complete larger heat transfer tasks.



The compact, light weight design of these exchangers also saves floor space and cuts installation costs. They contain less volume than other exchangers, reducing the quantity of expensive or hazardous fluids in the system and improving thermal response. Enheats drain completely, when they are mounted horizontally.



#### Key Features

- Very high heat transfer
- Compact design
- Low pressure drop
- All welded construction
- Very resistant to fouling
- Economical

#### More Reliable

Enheat's all welded construction produces a more rugged unit without gaskets which may leak. Since they are made only of one metal, they are not subject to bimetal corrosion that can attack brazed units.

Standard Enheat models are constructed from Type 316 stainless steel. Standard Enheat models are designed and tested for 35 psig pressure at 230°F. They can be custom designed for higher temperatures and pressures.



## Incredibly Efficient

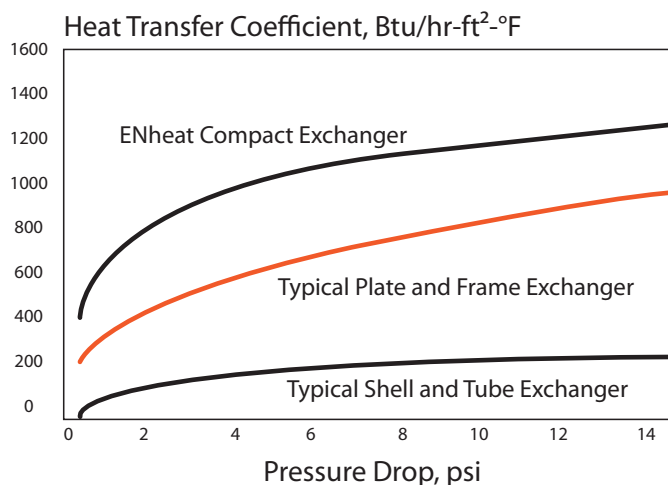
The ENheat exchanger provides maximum efficiency while transferring heat from steam or from one liquid to another. Each unit consists of a series of parallel plates, embossed with carefully designed dimples, which are tightly fitted together.

The narrow gap between the dimpled plates squeezes the fluids to near boundary layer thickness, producing high turbulence and very high heat transfer. This feature also minimizes pressure drop through the exchanger. Often the performance of an ENheat is two to five times better than that of equivalent plate and frame or shell and tube units.

ENheat's compact design provides true counter current operation. This feature maximizes the temperature difference between the two sides of the exchanger and heat transfer. Counter current flow also allows closer temperature approach than other designs and improves heat recovery.

Standard units are a single pass design. Multiple pass units, with longer residence times, are also available.

## Comparison of the Efficiency Of Different Types of Heat Exchangers



## Very Resistant to Fouling

The high shear and turbulence created as the fluid moves through an ENheat scours its plates and keeps them free of deposits. This characteristic helps keep pressure drops low. The fouling factor for ENheats is normally only about one tenth that of shell and tube exchangers.

Because both passages through the exchanger are identical, ENheats are especially well suited for transferring heat between two process fluids.



Model	Transfer Area, ft <sup>2</sup>	Connection Size, inch	Capacity, lbs/hr of steam	Weight, pounds
4 x 4 - 4	0.5	1/2	55	3
4 x 4 - 14	1.6	3/4	105	8
4 x 8 - 14	2.9	1 1/4	300	13
4 x 12 - 14	4.4	1 1/4	300	19
4 x 18 - 14	6.6	1 1/2	410	26
4 x 18 - 20	9.4	2	675	42