



**HEATEC**

# Fuel Heating and Storage Systems

**WE BUILD A WIDE VARIETY OF SYSTEMS** for heating and storing fuel at hot mix plants. Systems are configured to meet the special needs of your plant. A typical system includes a heavy fuel preheater, fuel storage tanks, fuel pumps, filters, strainers and piping.

## Heavy fuel preheaters

Heavy fuel pre-heaters heat the fuel as it flows to the burner of an aggregate dryer or other heating equipment. Pre-heating lowers the viscosity of the fuel so it can be properly atomized by the burner. Two types of preheaters are available. One type incorporates a coil that uses thermal fluid as its source of heat. The other has electric heat.

Stand-alone preheaters can be used with existing tanks. New tanks can be ordered with built-in preheaters. Built-in preheaters are mounted inside the tank and have no insulation. But heat escaping through their walls is not wasted because it heats fuel in the tank. The fuel is then heated on-the-fly as it flows through the preheater to the burner.

### Recent improvements

Recently we made major improvements to our thermal fluid preheaters. Of particular importance are their new modulating controls and removeable coil unit for easy cleanout.

The new heavy fuel preheater produces significant benefits when operating an aggregate dryer/drum mixer on heavy fuel. Precise control of fuel temperature should increase burner efficiency of a dryer 1 to 2 percent for savings from \$200 to \$400 a week.

Test results show it heats and maintains heavy fuel at optimum temperature, within one or two degrees. (Please see graph.) This is the key to improved benefits.

### Significance of precise temperature control

It's a well known fact that heavy fuel at optimum temperature burns more efficiently than fuel at higher or lower temperatures. Thus, the burner of a dryer/drum mixer uses less fuel when its fuel is at the right temperature. And since dryers use relatively large amounts of fuel, the savings can be significant.

Moreover, fuel at temperatures much higher or lower than optimum produce adverse side effects on hot mix quality, bag house filters, stack emissions and burner operation.

Here's what happens: Fuel at a temperature several degrees *lower* than optimum does not atomize properly. Consequently some fuel droplets do not burn, so combustion is incomplete. Unburned fuel can coat the aggregate, degrading hot mix quality. Unburned fuel can contaminate bag house filters. Unburned fuel also produces unwanted emissions that pollute the atmosphere.

Fuel heated to a temperature *higher* than optimum can cause a different problem. If its temperature goes high enough for the fuel to vaporize it will cause the burner of the dryer/drum mixer to shut down.

### Other features of the preheater

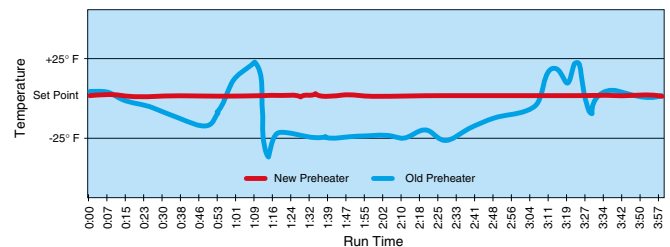
The preheater uses serpentine coils of finned pipe. The fins are serrated and increase the heat-transfer area of the pipe about 800 percent more than bare pipe. The serrations also increase efficiency by increasing the turbulence of the heavy fuel flowing around the fins. This turbulence increases the efficiency of heat transfer.

The entire coil bundle can be removed by unbolting the head and sliding it out. This allows easy access to the preheater shell for cleanout of sludge and debris left by heavy fuel. A drain valve facilitates draining water that may accumulate in the shell.

The preheater is designed to raise the temperature of heavy fuel up to 100 degrees F at a flow rate of 1,000 gallons per hour. As an option, it can be built to ASME code. It has a smaller footprint than earlier models.



New heavy fuel preheater that uses thermal fluid. Available as a stand alone unit or built into the fuel tank. The flow of thermal fluid is regulated by a fully modulating valve automatically controlled by a digital controller.



Graph from field tests shows temperature variations of new preheater's modulating control compared to non-modulating control of older products. Note how new unit (red line) maintains temperature at setpoint with great accuracy. Note how old preheater (blue line) has temperature swings 25 degrees higher and lower than set point.

## Fuel tanks

All of our fuel tanks meet the requirements of UL-142 and are stamped to show compliance. UL-142 covers a wide range of safety-related issues involved in design and construction of tanks for above ground storage of certain liquid fuels. The tanks are fabricated, inspected and tested for leakage before shipment from our factory. Our standard designs provide numerous choices:

- Capacities: 5,000 to 25,000 gallons.
- Vertical or horizontal
- Portable or skid-mounted
- Leak protection
- Multiple compartments
- Heated and insulated
- Internal fuel pre-heater

### Vertical or Horizontal

Vertical tanks occupy much less ground area than horizontal tanks of the same capacity. They are usually the best choice for stationary plants because of the space they save. However, they are not available in a portable configuration. Thus, horizontal tanks are the most practical choice for portable plants.

### Portable or skid-mounted

Portable tanks are mounted on a frame with wheels and suspension so they can be pulled by conventional truck tractors for highway travel. Thus, moving them from one location to another is fast and easy and does not require use of cranes.

Skid-mounted tanks have steel bases or skids that rest on the ground or concrete pads. Moving and erecting skid-mounted tanks require use of a crane and flatbed trailer.

### Leak protection

We offer two types of tanks for protection against leakage onto the ground. One type has double walls so there is a tank within a tank. The other type has diked construction, which includes an enclosure around the bottom half of the primary tank. Enclosures of diked tanks have capacities at least 110 percent of the primary tank.

Our portable horizontal tanks (DCT-P) are available with double-wall construction.

Our stationary horizontal tanks (DCT) are available with diked construction. The space between the primary tank and its enclosure can be monitored for leakage into that space.

### Multiple compartments

Horizontal tanks can be built with internal bulkheads that divide the tank into two or more compartments.

### Heated tanks

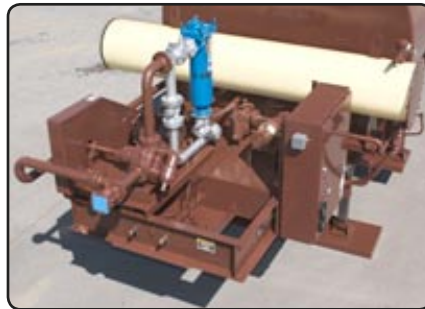
Tanks are available with heating coils. The coils are heated by thermal fluid from a hot oil heater. Electric heating is also available. Insulation is optional.

### Pumps, filters, strainers, etc.

We can provide a complete system including fuel unloading pumps, sock filters, duplex strainers, valves and piping.



Portable 15,000 gallon fuel tank with double walls. Has 90 kw electric preheater (external).



Fuel unloading pump, sock filter, duplex strainer, fuel preheater and control panel. Controls for the electric preheaters maintain precise temperature control, just as with thermal fluid preheaters.



Vertical fuel tank, 20,000 gallon capacity.



Horizontal fuel tank, built-in fuel preheater.



DCT-20 fuel tank with diked construction.

**Heatec, Inc.** an Astec Company

5200 Wilson Rd., Chattanooga, TN 37410

Phones 423-821-5200 • 1-800-235-5200 • FAX 423-821-7673

