UNIFLUX Fluid Heat Transfer Systems

Forced circulation liquid heating systems for oilfield production and offshore use. Combine the proven reliability of UNIFLUX with fire-resistant, no-pressure heat transfer fluids for safety and dependability

Quality Heaters Since 1957

UNIFLUX teams up with heat transfer fluids for **safe**, sure oilfield and offshore production use.

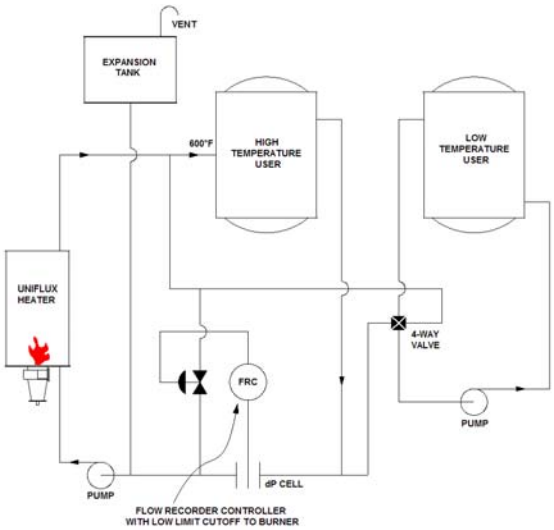
Steam heating systems, using a fired heat source, have not been entirely practical for use in hazardous atmospheres. The need for safety has been too great, particularly on offshore oil production structures. When used, heaters have had to be placed on separate rigs in compliance with safety and insurance requirements.

Now an exceptionally safe process heating has become available to the petroleum industry – particularly for offshore production: UNIFLUX – our proven safe, reliable process heater – has teamed up with new heat transfer fluids to provide process heat for oilfield and offshore production.

The problems associated with conventional direct fired and pressurized vapor heating are virtually eliminated. Forget the uneven heat distribution, the temperature control problems, the hazards of operating a fired heater in a hazardous area. Since up to 650°F is available, greater flexibility in heat applications through the whole range of processes is possible with a low pressure system. And remember, with the high temperature available you can forget the costly high pressure piping, valves and processing equipment, the constant chemical conditioning of boiler water, and other nuisances associated with high pressure systems.

With a UNIFLUX fluid heat transfer system, you get:

- Easily and automatically controlled process temperatures.



- Lower heat media make up.
- Greater freedom in location of heat exchangers and other equipment.
- High level of safety

Safety is the major consideration

A UNIFLUX process heater is *safe*. The process industries have relied upon the safe operation of UNIFLUX for years. Its patented fuel reactor eliminates flashbacks as incoming combustion air is always moving at a greater velocity than the rate of flame propagation. The heat exchanger cabin is filled with inert gas. Positive pressure throughout the fuel reactor and heat exchange cabin prevents inspiration of combustible or explosive vapors from outside. Low pressure fuels may be used.

The reactor and heat exchanger form a sealed system that can be completely automated with operational safeguards and accessories which comply with standard insuring agencies.

Fluid heat transfer offers many advantages

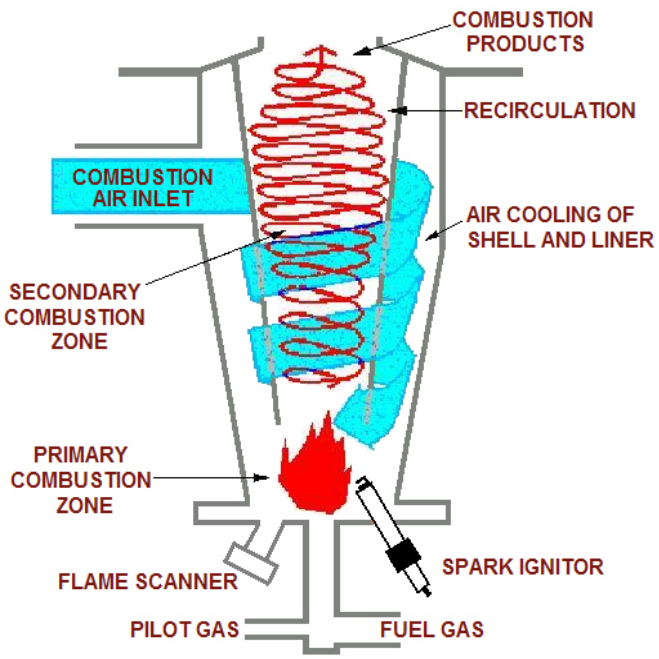
Our engineers will recommend the most appropriate type of heat transfer fluid for your processes. Several are now available that are Underwriters' Laboratories approved, safe, heat stable, and permit high process temperatures with low system pressure.

A UNIFLUX fluid heat transfer system employs forced circulation through a closed circuit to one or more heat processing units. *It is an ideal system for your heat requirements.*

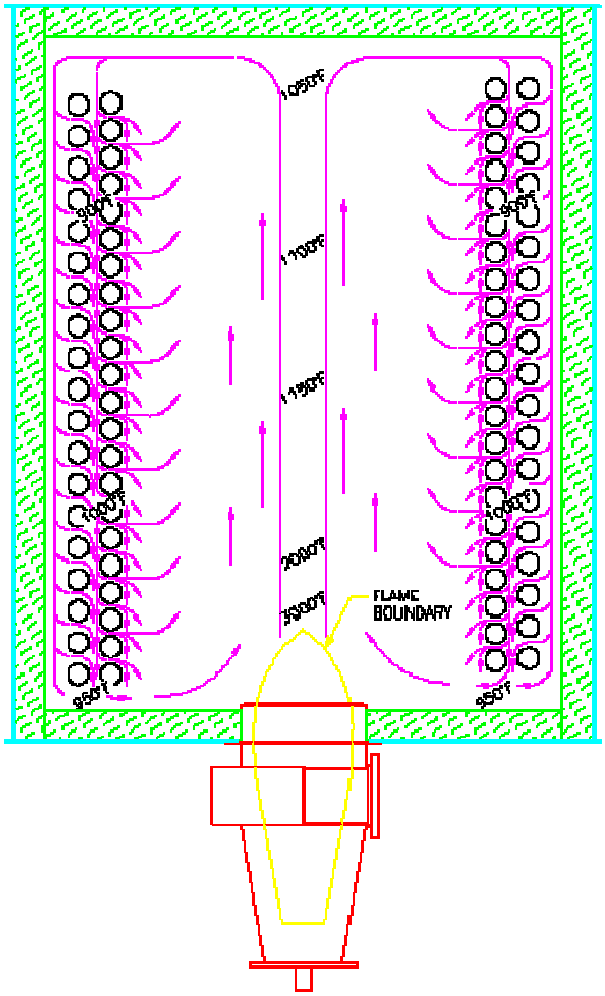
Uniform heat reduces fluid degradation

Predictable and uniform flux rates throughout the heat exchanger prevent hot spots and prolong the life of heat transfer fluids and the heat transfer coil piping.

Our engineers – completely familiar with the petroleum industry and the application of UNIFLUX fluid heat transfer systems – will gladly discuss ways you can employ this efficient medium for utmost economy, safety and increased production.



FUEL REACTOR



Advantages of UNIFLUX®

FUEL REACTOR

COMPACT: With high heat release, the reactor is designed for compactness.

FAST RESPONSE: The Fuel Reactor responds instantly to process load changes with its high velocity exhaust gases.

ALL-METAL CONSTRUCTION: Cooling effect of inlet combustion air keeps inner and outer cones cool, even when reactor is operating at full capacity. Temperature on outer cone approaches temperature of inlet air. The need for refractories is eliminated.

LOW PRESSURE FUEL: With vortex at the point of fuel injection, low pressure fuels down to 6" WC can be effectively burned in the reactor.

HIGH HEAT RELEASE RATES: About 10,000,000 BTU/Hr/ft^3 of combustion volume in firing natural gas.

MINIMUM FLAME EXTENSION: Combustion is essentially completed within the Fuel Reactor with only high temperature inert combustion products emitted.

STOICHIOMETRIC COMBUSTION: The reactor is adjustable to stoichiometric fuel-air ratios with complete combustion assured within the reactor. It operates over wide range of turndown with stable combustion.

SAFE OPERATION: The Fuel Reactor is sealed – eliminating flashbacks and the need for flame arrestors; it can be completely automated and controlled with optional safeguards and accessories.

MULTIFUEL CAPACITY: The fuel reactor will operate on most gaseous fuels including low heating value gases. High velocity fuel reactors are also available to operate on most liquid fuels.

HEAT EXCHANGER

UNIFORM HEAT FLUX: High circulation or exhaust gases around tubes results in a convective heat transfer to the process tubes. This means lower tube wall temperatures can be used for the same average heat transfer rate as with conventional heaters.

NO FLAME IMPINGEMENT: Complete combustion within Fuel Reactor means no flames within the tube area. Tube walls are safe from flame. Coking of tubes is minimized.

HIGH THERMAL EFFICIENCY: Using Uniflux® tube banks alone, efficiencies of 80% are achieved. With an economizer unit, efficiencies to 95% are achieved. Due to the controlled fuel/air rations, Uniflux® efficiencies increase as the heat load decreases.

SAFE OPERATION: No flashbacks are possible with the sealed Fuel Reactor. Inert gases in the Exchanger cannot support combustion.

LIGHTWEIGHT INSULATION: The wall construction of the exchanger consists of a stainless steel liner with a carbon steel outer shell and lightweight, low conductivity fiber insulation sandwiched between. This cuts weight and heat retention to less than 10% of refractory linings.

SHOP ASSEMBLED: Delivered completely assembled. Only process piping and electrical connections are required.

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LOWER FLUID MAKEUP: As a low pressure fluid system, lower heat media makeup requirements can be expected.

HIGHER AVAILABLE FLUID TEMPERATURES: Allows greater flexibility in process design without making a high pressure system necessary.

AVOIDS STEAM "HAMMER": As an all-liquid system, steam "hammer" is eliminated.

FORCED CIRCULATION: Allows greater freedom in locating heat exchanges, process equipment in relation to the heat source.

UNIFLUX: How It Works

Two major components make up UNIFLUX – the Fuel Reactor and the Heat Exchanger. The Fuel Reactor efficiently produces the huge volume of hot, inert gas for the Heat Exchanger and accounts for many of UNIFLUX's advantages.

Air from a low pressure blower enters the reactor with a rotational flow, generating a vortex and a low pressure area at the fuel injection point. The low pressure area of the vortex allows use of low pressure fuel and the mixing of fuel and air in a highly turbulent ignition zone.

The combustion process is completed within the reactor with essentially no flame extension and at an exceptionally high temperature.

High temperature inert gas from the reactor enters the venture-shaped muffle of the Heat Exchanger at high velocity. Passing through the muffle and between the inner tubes of the exchanger, the hot jetstream of gas strikes the top of the exchanger and reverses direction of flow down the back side of the heat-transfer tubes.

The rapidly counterflowing gas circulates around each tube in the exchanger, transferring uniform heat through tube walls to the process fluid.

The effect of the hot gas moving at high velocity into the venture-shaped muffle of the exchanger causes fast recirculation throughout. Cooler gas at the bottom of the exchanger is drawn into the high-temperature gas jetstream entering the exchanger and tempers its high temperature to allow safe, convective heat transfer.

For proof of versatility of performance check out this sampling of typical UNIFLUX applications:

• Superheating oxygen to 1600°F. • Burning of low pressure fuel gas, including flare gas, with only a few inches W.C. fuel pressure required. • Generation of inert gas for atmospheric or pressure discharge with waste heat recovery by generation of steam or heating process fluids. • Waste disposal with waste heat recovery. • Intermittent heating. • Heat sensitive process stocks. •Utilization of low BTU fuel gases. • Utilization of hydrogen sulphide or acid gases as fuel. • Chemical reactions combined with process heating. • Vaporization of a wide range of cryogenic liquids. • Direct heating of crude emulsions.

Typical heater control panel for an offshore application. Note the 316 SS construction, MC Cable, and orderly fabrication.

Uniflux heater and Pump Skid: This is a close-up of the left side of the cover photo. This unit has been in service since 2002.

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