



THERMAL FLUID SYSTEMS

Typical applications

- » Reactor Vessel Heating
- » Jacketed Vessel Heating
- » Platen or Press Heating
- » Tank Heating
- » Suction Heating
- » Heated Molds or Dies
- » Calendar Roll Heating
- » Ovens and Fryers
- » Dryers
- » Autoclaves
- » In-Line Liquid Heating
- » In-Line Gas Heating
- » Indirect Steam Generators
- » Building Heaters
- » Process Reboilers
- » Natural Gas Heating
- » Crude Oil Heating

Thermal fluid heating, sometimes referred to as thermal oil heating, is a type of indirect heating in which a liquid phase heat transfer medium is heated and circulated to one or more heat energy users within a closed loop system. Thermal fluids offer the user the capability of high temperature operation (up

to 600°F with organic thermal oils and 800°F with certain synthetics) at very low pressures. Due to the low operating pressure and properties of thermal oils, most heaters are built to ASME Section VIII, and a licensed boiler operator is not typically required.

Sigma Thermal offers standard thermal fluid heaters, custom engineered thermal fluid heaters, complete thermal fluid systems and a full range of parts and support for your process.



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HC-2 Thermal Fluid Heater *Design Features*



Double Helical Coil Design: This design allows for three passes of flue gas along conservatively designed coil surface area.

Efficiencies: Base efficiencies can exceed 88% (LHV Basis) depending on process inlet temperatures, and with an optional economizer can exceed 93% (LHV basis).

Minimal Maintenance: Flue gasses are significantly cooled therefore eliminating the need for most internal shell insulation. This minimizes long term insulation maintenance and / or replacement.

Insulation: The heater shell is externally insulated with mineral wool insulation and covered with aluminum cladding.

Fuel Source and Burner Flexibility:

Standard or engineered burner configurations are available for use with both traditional and alternative fuel sources. Low emissions burners can be supplied to meet all emission requirements (e.g., Low NOx, Best Available Control Technology).

Range of Configurations: The HC2 can be designed in various configurations to fit your process. Heater Configuration options include vertical up-fired, vertical down-fired, and horizontal.

Classification: The HC2 can be designed to meet all area classifications and to endure harsh environments.

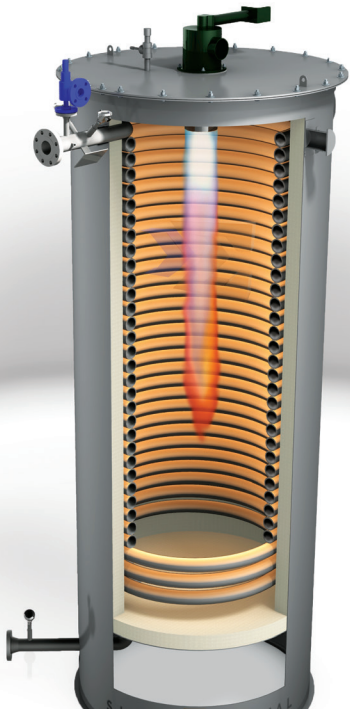
Capacities: Net output capacities are available from 500,000 to 75MM Btu/hr.

Advanced Control Systems: Complete control systems are engineered to optimize system safety and performance. Sigma thermal can supply simple and cost effective standard panels, as well as full process automation and PLC based combustion control / BMS.





HC-1 Thermal Fluid Heater *Design Features*



Single Helical Coil Design: This design allows for two passes of flue gas along conservative coil surface area.

Conservative Design: Single coil design offers sturdy reliability at a lower cost than the HC-2. Generous combustion chamber size ensures no flame impingement to the coil.

Insulation: The heater shell is internally insulated with ceramic fiber insulation and externally painted

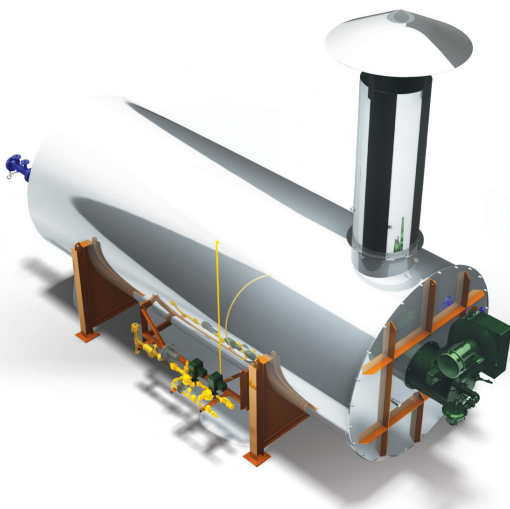
Fuel Source Flexibility: Sigma Thermal can provide standard or engineered burner configurations for use with both traditional and alternative fuel sources. Low emissions burners available to meet all emission requirements (e.g., Low NOx, Best Available Control Technology).

Range of Configurations: The HC-1 can be designed in various configurations to fit your process. Heater Configuration options include vertical up-fired, vertical down-fired, and horizontal.

Classification: The HC-1 can be designed to meet all area classifications and endure harsh environments.

Capacities: Net output capacities are available from 500,000 to 20MM Btu/hr.

Advanced Control Systems: Complete control systems are engineered to optimize system safety and performance. Sigma thermal can supply simple and cost effective standard panels, as well as full process automation and PLC based combustion control / BMS.





Vertical up-fired system with custom waste gas burner, redundant combustion air fans, and combustion air pre-heat system.



Combustion Air Pre-heat System

Complete Thermal Fluid Systems and Custom Engineering

For customized needs, Sigma Thermal offers engineered thermal fluid heaters and complete thermal fluid systems. With a broad range of design capabilities, Sigma Thermal can create a complete system to support any application.

Examples

- » Dow A/Therminol VP-1 Vaporizer
- » Pump Skid Packaging
- » Temperature Control Skid Packages
- » Tanks and Vessels
- » Exhaust Stacks
- » Ladders and Access Platforms
- » Fuel Train and Valve Manifolds

Economizers

With the typical elevated operating temperatures associated with thermal oil systems, it can be difficult to obtain high efficiencies in the heater alone. Sigma Thermal offers a wide variety of economizers to fit your process requirements, increase your thermal efficiencies, and lower your operating costs.

Common Waste Heat Consumers

- » Combustion Air Pre-heat
- » Boiler Feedwater
- » Steam Ejectors
- » ORC Generators
- » Building Comfort Heat
- » Wash Water Pre-heat
- » General Process Heat

