

SINGLE FLUID HEAT TRANSFER SYSTEM

WHAT IS SFHTS?

Many batch and semi-batch processes in the chemical industry require both heating and cooling from the same equipment, such as a jacketed reactor. Operational simplicity often requires the same heat transfer fluid (HTF) for both services. Some unique design considerations include:

- Specific heat and density properties over the full temperature operating range.
- Vapor pressure at the high end of the temperature range.
- Viscosity and pump ability at the low end of the range.
- Maintaining the mass balance between cold and hot loops
- Overall cost.
- Plant preference.

A variety of HTF systems offer combined heating and cooling service. System design often requires accommodating owner preferences, rather than following strict process design considerations. In selecting a common HTF, consider the operating temperature range requirements carefully. Consider steps to manage HTF transfer between the two interconnected systems, although such transfers usually balance out as a natural consequence of operations in a batch process. Take special care to remove water from non-aqueous HTF systems, especially the cold HTF system.

WHY SFHTS?

Systems that must heat and cool often use the same HTF because using different HTF's may require separate coils, separate heating and cooling jacket zones, or outside heat exchangers, each of which complicates mechanical design.

Different HTF's may be used in a common jacket, but operations are complex because the fluids must be drained before changeover from heating and cooling and back again. An examination of alternatives using a jacketed vessel illustrates some approaches and challenges.

Also because of the below disadvantages in conventional heating/cooling

All utility header lines laying till the Reactor (Economy affected)

- Utility cross contamination (Time of control affected)
- Cumbersome utility changeover process (Time of control affected)
- More manpower required for changeovers (Economy affected)
- During utility change over, process interruption and out of control (Productivity affected)
- Utility wastage (Energy Conservation)
- Corrosion problem to the reactor jacket because of multiple HTF's (Economy affected)
- For sodium based reactions, presence of traditional HTF may pose an explosion hazard (Safety)
- No accurate temp. control (Productivity affected)

To avoid all these possibilities, SFHTS is the single effective solution.

WHERE SFHTS?

S F H T S finds its purpose in various temperature based applications like,

- Crystallization Reactions – For better productivity
- Non-Aqueous Reactions: Critical application where Aqueous utilities are to be not used for heating/cooling, which leads to hazardous conditions (eg:- reactions which involve materials like Sodium Hydride, etc.,) – For Safety
- Metal Reactions – For better batch-to-batch repeatability
- Alternate Heating & cooling process application (where utility change over is a wastage of time & tiresome job)
- Applications where sudden temperature rise, causing thermal shocks.

And many more applications where, (SFHTS) is far more superior to the conventional system.

SKID DESIGN



**SFHTS SKID
TECHNICAL DETAILS**

- Heat Exchanger of suitable capacity of welded construction in S S Material confirming to ASME standards – Sec VIII – Div I
- Centrifugal pump with mechanical seal, rated for handling viscous liquids over a wide temperature range and confirming to API* standards –ISO 2858
- Drive motor FLP / NFLP confirming to IS 12615
- Piston type valves for manual operation, from branded manufacturers
- 2-way / 3- way auto operated proportionate control valves
- Strainers for capturing dust particles in piping
- Non return valves in piping
- Expansion tank fabricated out of C S* as per pressure vessel code of ASME Standards
- Temperature sensors in piping
- Temperature controllers & Display units
- Complete pipe network in Carbon Steel and piping as per ASME Standards
- Integrated control panel with HMI* for system operation
- Control panel with HMI / PC for operation near Reactors
- All components mounted rigidly on a skid fabricated out of C S box sections
- All Electrical components rated for fire protection

**ADVANTAGES
WITH SFHTS**

- No leakage at process area
- Single Heat transfer fluid media
- Corrosion free – extends the equipment life
- Cleaned process area
- No utility cross contamination (reduced inventory & energy saving)
- No steam traps at reactor -saves energy (piping network & valves)
- Centralized control
- Precision temperature control – right choice for crystallization
- No hot & cold spots in turn results product yields with quality
- Easy to Maintain
- One time investment
- Piping network is more aesthetic
- No thermal shocks to reactor mass/GLR
- Consistent batch-to-batch repeatability
- Improved productivity(raw materials saving without addition of excess reactants)
- Recipe based control and data logging
- No utility load on effluent
- Eliminates drain sumps
- No contamination to steam condensate

WHY US?

- Pioneers in process Instrumentation & automation for the last 20 years
- Pharma Process domain expertise
- Prompt post project service support with dedicated servicing team
- Quick response for the customer queries through dedicated technical team
- Proved proprietary design software for calculation of heat loads/pump/PHE/piping/flow rates
- Customer friendly
- Competitive pricing
- Right & Reputed international component selection
- Better delivery periods
- In-house chemical process engineers
- Consultancy services on utility requirement & equipment design

More Information

For more information on SFHTS & Fermenter, contact your POLMON Vesenfr account manager

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