Proper System Startup and Shutdown is Important

Proper System Start-up

Even though you may not realize it Proper System Startup is critical to your Heat Transfer Fluid. Significant damage to fluids — and equipment — can occur if the system is not started up properly.

Heat Transfer Fluids become less viscous as temperature increases. As the fluid gets thinner, its efficiency (heat transfer coefficient) increases dramatically.

Heat Transfer Fluids at lower temperatures of 120°F or less tend to have much higher viscosities and will not flow as efficiently. During startup, the cold fluid is not able to flow as well and absorb as much heat from the heater tubing compared to when it’s hot. It is important for the fluid to reach turbulent flow conditions for proper heat transfer conditions. If the temperature rises too quickly, the fluid film at the heated surface can begin to crack or thermally breakdown. This can result in the formation of low and high boilers in the system. This can eventually result in increased coking or higher vapor pressure over time. A system that has a repeated on and off cycles can result in continuous build up of degradation products in the oil and shorten life of the heat transfer fluid considerably.

In starting up, circulation should be started at ambient temperature then the heater raised to about 25°F above those conditions. The temperature should then be raised gradually in 25°F increments until the fluid reaches turbulent flow or till the heat transfer fluid reaches approximately 10 cP viscosity (check fluid property tables). Most fluids reach turbulent flow at approximately 180°F so at this point the temperature can be raised at a higher rate, approximately 50°F to reduce the impact to the Heat Transfer Fluid.

Proper Shutdown is just as critical to reduce degradation of the Heat Transfer Oil.

The circulating pump should not be shutdown until the outlet temperature has decreased to 200°F (93°C) or lower.

MultiTherm® introduces new Flushing Fluid, MultiTherm FF-1® for change-outs and system maintenance.

Key Points in this Issue:

- Proper Startup of Heat Transfer Fluids is important to reduce degradation of the oil.
- Start up by circulating fluid at cold near ambient condition followed by gradual increase in temperature in 25°F increments till fluid reaches 10 cP or turbulent flow at about 180°F.
- Proper Shutdown is just as critical to reduce degradation of the Heat Transfer Oil.
- The circulating pump should not be shutdown until the outlet temperature has decreased to 200°F (93°C) or lower.
- MultiTherm® introduces new Flushing Fluid, MultiTherm FF-1® for change-outs and system maintenance.
Proper System Shutdown

Just as a proper system start-up is important, it is as critical to shut your system down properly.

Normal conditions, the fluid should be operating at turbulent flow for ideal performance. The turbulent flow of the fluid minimizes the film and bulk temperature of the fluid while maintaining high film coefficient to allow for proper heat transfer through the tubing.

Should the Heat Transfer Fluid flow rate decrease while heat input remains constant, the film and bulk temperature will begin to rapidly increase. This is because there is not the fluid mass flow rate to transfer the heat through the tubing wall. This could result in raising the fluid temperature above its bulk film temperature resulting in thermal cracking of the fluid and further degradation of the oil.

To avoid this problem, the heater should be turned off while keeping the circulating pump running. The pump should be kept running until the heater outlet temperature has reached 200°F (93°C) or lower.

For additional technical support call the TechTeam at MultiTherm® at 800-225-7440.

Welcome to the Inaugural Issue of MultiTherm’s TechTeam® Report’s

MultiTherm’s TechTeam® Report will be coming out quarterly at the beginning of January, April, July, and October. We can mail a hard copy or e-mail it to you, whichever you prefer. If there is a topic you would like us to address or a case study you would like to share, please feel free to contact us or fill in the form below and fax it back to 610-408-8365. We like to hear from you and get your opinions so that we continue to provide you with the right type of products and services. Thanks for reading our inaugural issue.

Name: _________________________ Company: _______________________
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Comments: ______________________________________________________
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MultiTherm introduces their new Flushing Fluid, MultiTherm FF-1®

MultiTherm FF-1® is designed for use in start-up and general maintenance of heat transfer fluid systems. During new equipment start-up, it is an economical way to remove loose material such as weld splatter, fine particulate matter, etc. left in lines and equipment, along with oil and some preservative coatings. It is useful for general maintenance purposes for removing used heat transfer fluid, sludge and some coked on material from a system prior to recharge or changeover to another fluid.

Flushing your system with MultiTherm FF-1®, you can insure that your system has been cleaned in such a manor that it will run efficient and at peak performance. By keeping your system’s internal components clean, you can be confident that your heat transfer fluid will continue to run through your system without restrictions and thus increase equipment life and reduce maintenance costs.

Superior Communication and Service.
The Exception to The Rule!

The MultiTherm LLC has been a leading supplier of efficient, non-hazardous Heat Transfer Fluids since 1977. Within a temperature range of 170°F (-112°C) to 600°F (315°C), the company can successfully and economically accommodate a customer’s heating or cooling requirements however exacting they may be. Further, MultiTherm provides troubleshooting help and a fluid analysis service to determine the physical and chemical condition of the fluid.