

START-UP AND SHUTDOWN PROCEDURES

Regardless of system design, size or heat source there are a few basic procedures that should be followed when starting up or shutting down your heat transfer system. Following these procedures will help maximize the life of your fluid by reducing incidents of thermal degradation.

System Start-Up

A fluid at room temperature may have a viscosity higher than 100 cSt. If the system is outdoors and the ambient temperature is below 32°F (0°C), the viscosity could be as high as 1000 cSt, or higher.

While a fluid can usually be pumped at these viscosities, it's not yet ready for full heat. Both small electric and larger, gas-fired heaters could apply heat during start-up at the full rate even though the fluid is not yet prepared to take it. The fluid will be too thick to allow for efficient, turbulent flow and if a heater is allowed to fully fire during these periods it will most likely overheat and thermally degrade the fluid. The fluid is basically moving too slow through the heater under these conditions.

It may not always be possible to completely avoid this situation but there are few measures that can be taken which can help mitigate the damage to your fluid. Typically electrically heated systems will have a controller start up option that will allow for slower, easier starts. Gas fired boilers will have a similar low fire start option. In either case, your equipment manufacturer should be able offer some guidance.

If your system doesn't have these features, slowly increase the temperature by 20°F – 30°F increments to allow for steady, even heating without overheating and thermally degrading the fluid. Consult your equipment manufacturer for help with these features.

System Shutdown

When shutting your system down a few basic steps will help ensure that your thermal fluid isn't damaged by overheating.

During normal operation, your heat source will be cycling either on and off or from a low fire to a high fire in order to maintain your set point temperature. Keep in mind too that within a short period of time the boiler tubes or electric element's chamber will become nearly as hot as the heat source itself.

Therefore, it's important to remember that your heater is actually hotter than your output temperature and if the flow is stopped, there's a good chance it will quickly apply more heat than the fluid can handle.

If a system is shut down without allowing the heat source and adjacent areas to cool before the fluid stops flowing, it can become trapped and subsequently 'burn' or thermally degrade. For this reason it's important when shutting down any system to allow the fluid to cool below 250°F (121°C) before turning the pumps off. Using a heat exchanger or leaving your heater blower running will help speed up this cooling process.

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