DURATHERM
Heat Transfer Fluids

SYSTEM START-UP AND SHUT DOWN 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 0°C (32°F), 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 are capable of applying full heat at start-up 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 or crack the fluid. The fluid is basically moving too slowly either through or across the heater under these conditions.

It may not always be possible to completely avoid this situation but there are a few measures that can be taken which can help mitigate any 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 regarding the optimal settings you should use at start-up.

If your system doesn't have these features, slowly increase the temperature by 10°C – 15°C (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 Shut Down

When shutting your system down, a few basic steps will help ensure that your system's thermal fluid isn't damaged by unintended 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 far more heat than the fluid can safely handle.

If a system is shut down without allowing the heat source and adjacent areas to cool before the fluid stops flowing around or through the heat source, 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 121°C (250°F) before turning the pumps off. Using a heat exchanger or leaving your heater blower running will help speed up this cooling process.