

Thermal Fluids and Material Compatibility

To ensure your heat transfer system runs smoothly, it's components have to be made of materials compatible with your thermal fluid. The following is a rundown of the most common components and the major considerations for each one.

Seals - gaskets, O-rings

Seals are available in a variety of different materials, so we recommend working with your seal supplier to ensure they're rated for use with the type of fluid you're using*. This [seal application guide](#) is a great resource that helps determine which seal materials are compatible with a variety of different fluids. If you're still unsure, your supplier should be able to tell you if it's suitable.

Aside from fluid type, your seals should also be rated for your required temperatures and always be of good quality and purchased from a reputable source.

Metal components

Certain metals can either affect a fluid or be affected by a fluid**. For example, copper can act as an oxidation catalyst and break a fluid down and while aluminum doesn't hurt the fluid, some fluids can cause pitting/erosion in aluminum.

Your fluid provider is typically the best source for determining if your fluid is compatible with your system's metal components and confirming compatibility.

Pumps

Your pump should also be verified as suitable for use with your thermal fluid. In particular you'll want to make sure it's rated for the appropriate temperatures. Remember too that pumps contain seals which will also have to be rated for the required temperatures and for use with the type of fluid you're using, as mentioned above.

It's also important to consider fluid viscosity when comparing pumps, especially with applications that require lower temperatures. Remember that as temperatures decrease, viscosity increases, so you need to ensure your pump is able to move the fluid at the lowest possible temperatures (and highest viscosity) it might encounter.

Electric heaters

The key thing you'll want to consider is a heater's [watt density](#). Some thermal fluids will thermally degrade and literally burn onto the surface of the heater if the watt density is too high.

As a general rule of thumb for [Duratherm fluids](#), we recommend watt density to be 20-22 watts/inch for circulated systems and 10-12 watts/inch for a non-circulated system in order to avoid thermal degradation.

While sometimes overlooked, fluid compatibility is critical to ensuring your application runs smoothly. If you still have any questions please don't hesitate to [contact us](#).



Thermal Fluids and Material Compatibility

**Most Duratherm fluids are recommended for use with Buna-N or Viton seals. Seals rated for "oil and gas" or hydrocarbon use would also be acceptable.*

***Duratherm fluids contain metal deactivators that neutralize this reaction and ensure compatibility with all common steels, alloys, and even those with copper components.*

Michael Bates, Technical Director

1-800-446-4910 ext. 111