

US Pat. No.: 7,588,694

Technology Readiness Level: 5

Key components have been tested in relevant environments

Sandia has developed a heat transfer fluid (HTF) for use at elevated temperatures that has a lower freezing point than any molten salt mixture available commercially. This allows the HTF to be used in applications in which the expensive parasitic energy costs necessary for freeze protection can be significantly reduced. The higher operating temperature limit significantly increases power cycle efficiency and overall power plant sun-to-net electric efficiency.

One of the primary applications is dual use of this HTF both in parabolic trough solar fields as well as the thermal storage media in the integral thermal energy storage systems. There are many other industries that might also benefit from the development of this molten salt mixture, including those whose processes involve heat treating of metals.



Sandia's National Solar Thermal Test Facility

TECHNICAL BENEFITS

- Better high-temperature stability than currently available salts
- Relatively benign in terms of environmental impact
- Higher density and heat capacity
- Molten salts are significantly less costly than the oil-based HTF currently used
- Has virtually no inherent vapor pressure, allowing for use in thermal energy storage tanks

INDUSTRIES & APPLICATIONS

- Solar thermal power plant
- Energy storage
- Chemical synthesis
- Plastics and textiles manufacturing
- Food processing
- Paint production