

# Thermal Loop Systems

*By: Engineer Live Magazine - June 30, 2023*

Heat treatment processes are a crucial component of many manufacturing processes, and thermal loop solutions have become increasingly popular for achieving improved temperature control and consistent outcomes. But many OEMs are missing opportunities where thermal loop solutions offer more than just greater control. In this article, Peter Sherwin and Thomas Rücker, industrial heating technology supplier Watlow, explore the possibilities of thermal loop solutions.

A thermal loop solution is a closed loop system with several essential components, including an electrical power supply, power controller, heating element, temperature sensor and process controller. The electrical power supply provides the energy needed for heating, the power controller regulates the power output to the heating element, the heating element heats the material, and the temperature sensor measures the temperature. Finally, the process controller adjusts the power output to maintain the desired temperature for the specified duration, providing better temperature control and consistent outcomes.

## Performance benefits

Heat treatment thermal loop solutions offer several advantages over traditional heat treatment methods, including improved temperature control and increased efficiency. The thermal loop system provides precise temperature control, enabling faster heating and cooling and optimized soak times. In addition, the complete design of modern thermal loop solutions includes energy-efficient heating and overall ease of use.

Thermal loop solutions can also be integrated with Industry 4.0 frameworks and data management systems to provide real-time information on performance. Combining AI and machine learning algorithms can also provide additional performance benefits, such as the ability to analyze data and identify patterns for further optimization.