

Clean-In-Place Pillar 1: Temperature It is important to note that CIP temperatures are monitored and tracked on the CIP circuit return header to ensure that the entire system is fully heated. Cavitation from essentially uncontrolled boiling can occur at pump intakes, making the system more hazardous to operators. Unintended phase changes between steam and condensate also create a carbonic acid that attacks the pipe wall and decreases the useful life of a pipe. The water instantly changes to a superheat steam with even higher internal energy (entropy), which can cause damage to the surrounding equipment, structures and personnel. Obtaining and sustaining higher temperatures makes the CIP process more expensive and fundamentally more dangerous. This may be true from the perspective of some application sciences, but as a system approaches its boiling point, other issues arise. Higher temperatures mean the system contains more internal energy, enthalpy and entropy. Typically CIP systems operate at approximately 140°F–180°F. If pressure decreases in the circuit, this water will flash into steam causing hammer in your piping system. Moving more heat into a CIP system creates a higher temperature. Not necessarily...